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CALIFORNIA MANAGEMENT REVIEW

Winter, 1959

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Winter, 1959 VOLUME I • NUMBER 2

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The *California Management Review* seeks to build a bridge between creative thought about management and executive action. In pursuit of this objective, the *Review* is intended to serve as an authoritative source of information and ideas contributing to the advancement of management. It is directed to active managers, scholars, teachers, and others concerned with management.

Specifically, the *Review* will publish:

1. Results of research in all areas of knowledge which have significance for the management of both public and private enterprise.
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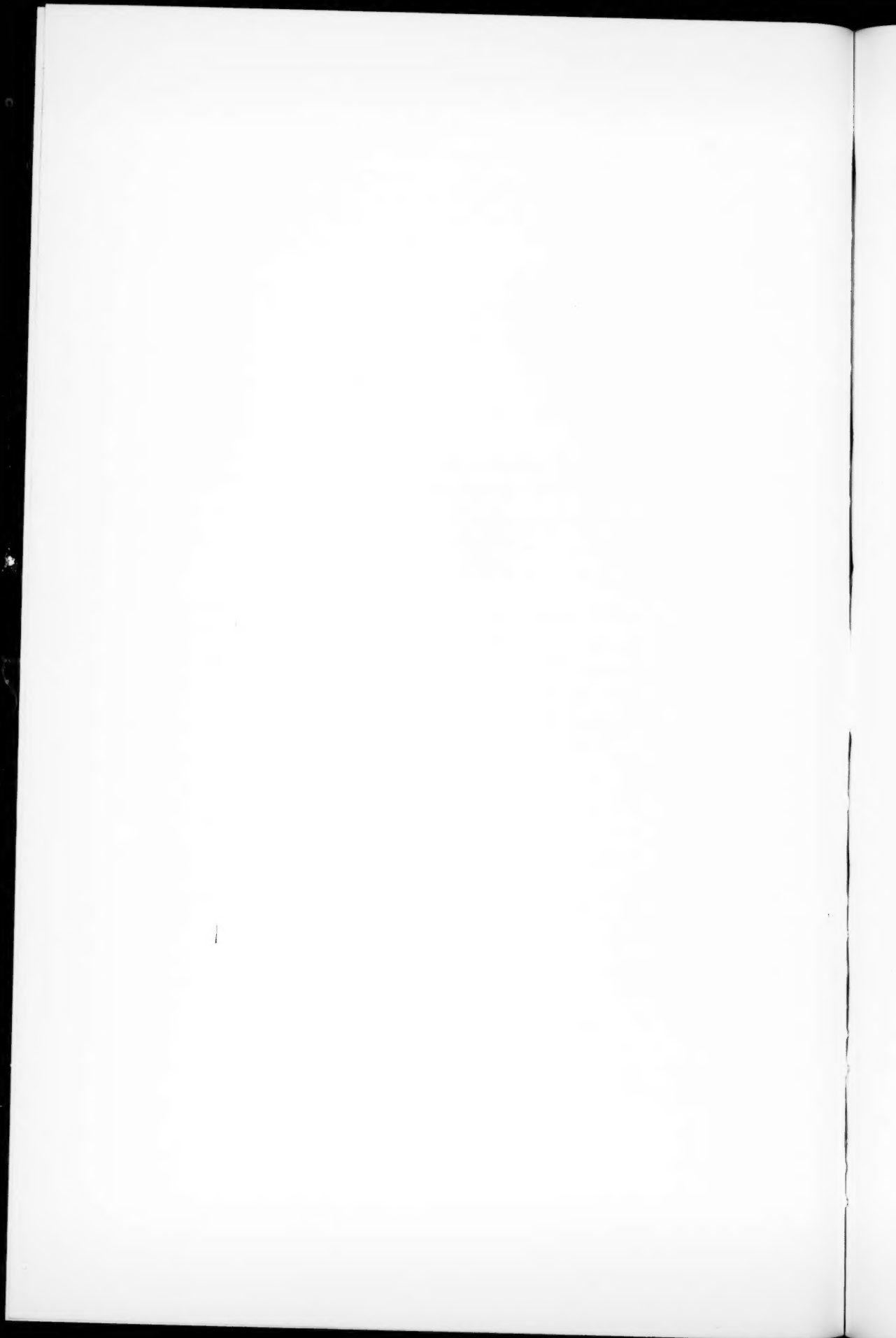
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The Editors are pleased to announce that the McKinsey Foundation for Management Research, Inc., has made it possible to award annual prizes for the two articles appearing in the *California Management Review* which contribute most to the objectives of the *Review*. The first prize will be \$1,000. The second prize will be \$500.

An Award Committee, to be appointed by the *California Management Review* Board, will make the selections. Authors with articles appearing in Volume I (Fall, 1958, through Summer, 1959) will be eligible for the 1959 Awards. Articles written by the Editors and members of McKinsey and Company are not eligible for the cash prizes.



CALIFORNIA MANAGEMENT REVIEW

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How Good Are Long-Range Projections of GNP for Business Planning?

.... Looking back, we have seen how industrial engineering, market research, control, and other techniques have given progressive companies an important edge over competitors. Looking ahead, I see long-range planning as another concept that will spell the difference between success and mediocrity in business.

(Bruce Payne in *Harvard Business Review*, March-April, 1957.)

With such a quotation as a point of departure, no one should be surprised if I answer the question posed in the title by saying, "Very good indeed." As a matter of fact, there is no point in my being coy about answering the question since the National Planning Association, with which I am connected, has been working on long-range projections for 15 years and is now in the process of developing more detailed projections, especially for use in business planning.

In elaborating my answer more fully, the first part of this article will discuss some of the arguments which have been advanced or may be advanced by skeptics. (I might add that, in contrast to some of the enthusiasts who may be claiming too much for this new tool of business management, I myself may appear to be quite skeptical.) The second part of this discussion will focus on the specific kinds of long-range projections which may be useful for business planning. In the concluding part I will attempt to outline what needs to be done

in order to make projections a still more useful tool of business planning.

FOR SKEPTICS

Before discussing the objections of those who are skeptical about the uses of GNP projections, I should emphasize that individual companies should not base their long-range planning exclusively on long-range market projections. Decisions affecting a firm's future business plans should always be made by using every bit of information available, including current trends in orders, rates of operation, changes in the competitive position, price and cost data, financial data and so on. Economic projections can never take the place of the conventional methods of business analysis; they can serve only as an additional but, I believe, very useful tool.

Most business economists hardly need to be persuaded that long-range projections of Gross National Product are a useful tool, particularly for business planning. In 1957 the National Planning Association circulated a questionnaire to 200 business economists and statisticians in order to determine the use made of long-range projections for business planning. Of the 100 who replied, 90% stated that their firms used long-range economic projections; only 7% responded in the negative. Of course

it must be noted that in using as our sample firms which employ economists and statisticians, we introduce a certain favorable bias. Nevertheless, the response does illustrate the wide use which has been made of long-range projections.

The fact that business firms have come more and more to use long-range economic projections in their business planning does not mean, however, that projections can answer all of a company's planning problems. To begin with, among the questions raised by skeptics is that of the accuracy and validity of projections which do not purport to predict all the vagaries of the economy. For example, since most long-range projections assume approximately full employment in the target period, the recent recession naturally raised some questions about the usefulness of these estimates for business planning.

The experience of the recession in a way underlines, rather than detracts from, the usefulness of this particular tool. If steady growth in all industries were assured, it would be much easier for management to use current orders as a guide for planning future expansion. But precisely because there are ups and downs in the business cycle, current economic events as a guide for long-range planning can be very misleading. At a time of extraordinarily favorable business conditions, management may indulge in exaggerated expectations and may plan for too much future expansion. At a time of temporarily slack business conditions, management may be prone to underrate future potentialities and may lose out to more forward-looking competitors. Long-range projections can serve as a means for appraising current trends—judging to what extent they exceed a pace of growth which can be sustained or to what extent they reflect a temporary slack in the economy as a whole or a specific industry. In this respect, long-range projections as at least a partial guide to long-range planning

seem to offer the best device for a business policy designed to exploit opportunities on the one hand and to protect itself against over-expansion on the other.

Therefore, the fact that we still have ups and downs in business is no argument against the use of long-range projections; on the contrary, it is the strongest argument for their use in long-range business planning.

The possible recurrence of recessions such as those of the postwar period, or even of somewhat greater severity, would not invalidate the usefulness of long-range projections for business planning. It is true that a firm which in 1928, let us say, had based its expansion program on a 5 or 10 year projection which assumed full employment, might have made a miscalculation with disastrous consequences. But a business planner who believes that depressions of the duration and severity as that experienced during the 1930's are likely to occur again will hardly use long-range full employment projections as a major guide for business planning. Projections which assume for the target period approximately full employment have a realistic value only if it is believed that recessions will be of relatively short duration and that prolonged and severe depressions are a matter of the past.

It was possible for business management to adopt long-range projections as a tool for planning only after governments in virtually all countries shouldered the responsibility for promoting conditions of economic stabilization and growth. Projections do not assume perfect success in reaching this goal, but they do assume some approximation of it.

Actually, all long-range projections make explicitly or implicitly some assumption (or alternative assumptions) with respect to employment and utilization of capacity not only for the target period but also for the intervening years between the present and the target period. Whatever the unemployment rate as-

CHART 1

GROSS NATIONAL PRODUCT, 1952-1960—ACTUAL AND PROJECTED

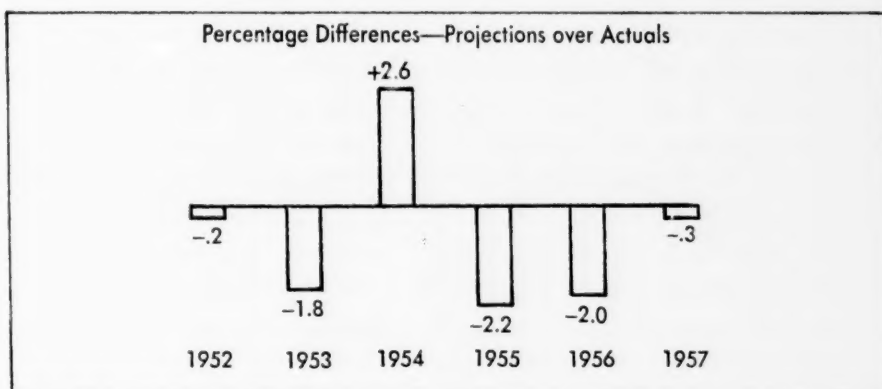
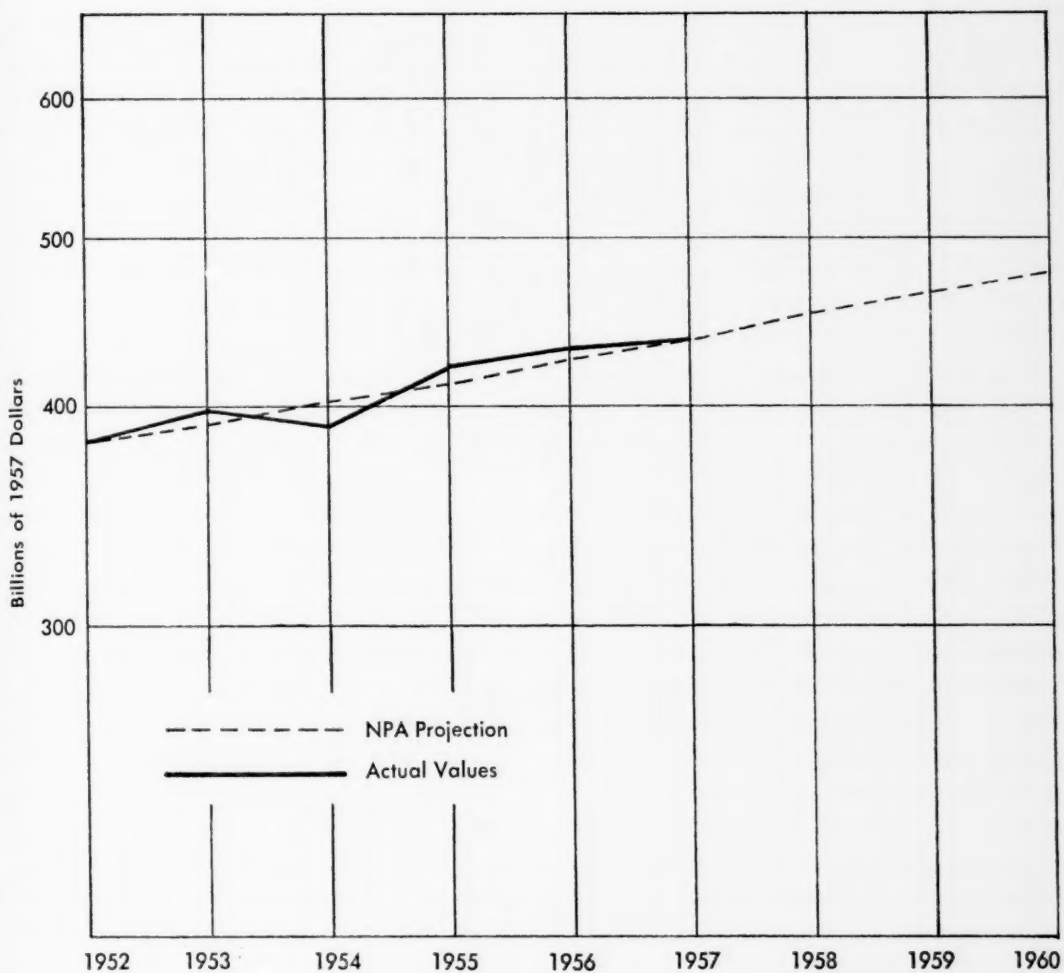


TABLE 1
GROSS NATIONAL PRODUCT, PROJECTED AND ACTUAL*
(Billions of 1957 dollars)

	GNP		Consumption		Investment		Government		Net Foreign Investment	
	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual
1952.....	381.0	382.6	238.1	235.8	52.1	57.9	89.8	90.4	1.1	-.2
1953.....	392.0	399.3	239.8	247.3	53.3	57.6	97.5	98.1	1.2	-2.2
1954.....	403.3	393.0	246.6	250.3	54.6	55.9	100.8	87.5	1.4	-.4
1955.....	414.9	424.2	263.4	269.3	55.9	70.5	93.9	85.4	1.7	-.4
1956.....	426.8	435.3	281.5	277.2	57.3	71.3	86.1	84.9	2.0	1.4
1957.....	439.1	440.3	296.7	284.4	58.6	65.4	81.6	87.1	2.2	3.5
1958.....	451.8	426.0	306.8	284.4	60.0	52.5	82.6	88.8	2.5	1.2
1959.....	464.7	.....	316.8	.....	61.4	.....	83.8	.....	2.7	.....
1960.....	478.1	.....	327.5	.....	62.9	.....	84.9	.....	2.8	.....

* In the projections study several different yet plausible breakdowns of the GNP total were presented. In this table the GNP composition used is from the projection called the "adjusted model."

Note: Projections and actuals have been deflated to 1957 dollars using Department of Commerce implicit price deflators shifted to a 1957 base.

Source: Actuals—Department of Commerce, *Survey of Current Business*, July, 1958.

Projections—Gerhard Colm, *The American Economy in 1960*. National Planning Association, Planning Pamphlet No. 81, 1952.

sumed as being compatible with "approximate" full employment, an allowance for periods in which unemployment would exceed that rate is built into the projections.

In this respect, it may be useful to compare NPA's projection of the Gross National Product for the years 1952 to 1960, published in 1952, with the actuals¹ (as far as they are available), as in Chart 1. The NPA projections, which were originally expressed in 1951 price levels, are in the chart calculated in 1957 prices and compared with actuals also expressed in 1957 values. (See page 3.)

The fact that the actuals in 1955 and 1956 were running substantially above the projections could be interpreted as reflecting some "over-employment" in these years. Actually, however, unemployment during these two years average 3.9%—that is, almost the 4% assumed as compatible with "approximately full" employment in the projection. That actuals were a bit above the projected figures

also in other years suggests that the estimates were on the conservative side.

If the GNP totals are broken into their major components, the relative differences between projected and actual figures become much larger, as shown in Table 1.

The main difference is that actual consumption and government expenditure remained below the projections; investment outlays have been running above projections. Here a methodological question may be raised. The projections imply a relationship between business investments and consumer and government demand which is thought to be "sustainable," that is, a relationship which would lead neither to surplus nor scarcity of capacity. The excess capacity which appeared in many industries in 1957 may suggest that aggregate demand actually had grown less than capacity. Thus, as an indication of a long-run "sustainable" relationship the projected figures may be more correct than the actuals. Available estimates of idle capacity are very uncertain, so that at present statements about the discrepancy between the increase in industrial capacity and the increase

¹ G. Colm, *The American Economy in 1960*, with the assistance of Marilyn Young. Planning Pamphlet No. 81 (Washington: National Planning Association, 1952).

in aggregate demand must be made with great caution.² Yet there is at least a possibility that the 1957-1958 recession could be explained in part as the result of a correction towards the sustainable relationship. We would not, therefore, be justified in denying the possible validity of the projected long-run sustainable relationship between an increase in investments and in aggregate demand.

Recognizing that the comparison between projected and actual figures shows greater relative discrepancies for the component parts than for GNP as a whole, the differences are not such that they invalidate the usefulness of the projection. Such a projection provides a more reasonable frame of reference for estimating the likely growth in the demand for a specific group of products than estimating future demand, e.g., by extrapolating orders of a recent period of the past or similar "rule of thumb" guides.

Another objection to GNP projections as a planning tool is that the increased use of projections by business enterprises may have contributed to overinvestment in recent years, and that current rather than anticipated market prospects are a sounder base for planning. The glowing estimates of potential markets for 1960, it is sometimes said, have made business overconfident and tempted some firms—with 1960 in mind—to strive to be ahead of others. Thus, it has been suggested, in some industries (e.g., air transportation) plans of individual firms for expansion have not only anticipated future industry markets but have also assumed an increase in their shares of the market—without any firm planning for a compensating decrease. In this attempt to improve their competitive situations, they contribute to excess capacity.

In reply to this argument, I would repeat that

² A recent article in *Fortune* magazine has taken issue with the McGraw-Hill estimates of idle capacity. See, Charles Silberman and Todd May, "How Much 'Overcapacity' in U. S. Manufacturing?" *Fortune*, September, 1958, pp. 128-131.

the degree of overinvestment is by no means clear. Perhaps it would be more justifiable to speak of an inadequate growth in the sum of consumer and government demand and analyze the reasons for that deficiency. It may be that more use of economic projections in the formulation of government policies could be useful for recognizing and counteracting such deficiencies.³

Long-range projections are tools for long-range investment programming. Additional considerations might determine the timing for an investment program. One business executive may want to anticipate market expansion in the hope of conquering a rising share for his firm. Another, more cautiously, may plan his capacity expansion so that his company may grow a bit more slowly than the demand for his products. By and large, the use of projections has helped business executives to "raise their sights." Therefore, use of this method has probably contributed to expansion of capacity and in that sense to economic growth. Moreover, I believe that, in general, the use of projections has contributed to greater stability in business investment planning. It is likely that the curve of investments will be less erratic if business executives plan investments for each year as part of a 5 or 10 year expansion program than if they are guided exclusively by current profits, orders,

³ Here we touch upon one of the most difficult problems of present day economic policy. During most of 1957 the authorities pursued a restrictive credit policy in order to meet the threat of inflation. The theory was that inflation results from excess demand ("too many dollars chasing too few goods"). Actually, in 1957 there was a deficiency in aggregate demand and the price rise was, in my opinion, more the result of a cost push than of excess demand. Credit restriction did not prove to be an effective tool for counteracting a cost rise, but it probably did contribute to the causes of the recession. Credit and fiscal policies seem to be confronted with the dilemma of either promoting economic growth or fighting inflationary trends. This dilemma can be solved, in my opinion, only by recognizing that credit and fiscal policy is not under all circumstances the most suitable means for combatting a price rise and should be supplemented by other policies.

and similar events which are subject to considerable fluctuations.

Thus, we conclude that the use of projections seems to be in the interest of the individual enterprises and also seems to contribute to the growth and stability of the economy as a whole. The experience of the recent recession has in no way proved that projections are unrealistic as a tool for business planning or that their use has substantially contributed to the causes of the recession. The arguments advanced by the skeptics, however, do support the conclusion that business management requires good judgment and the use of many other tools—as well as projections.

HOW TO USE PROJECTIONS

What kind of projections then are best suited for business planning? To answer this question we should first define more precisely what role projections serve in business planning. In the NPA questionnaire referred to earlier, 56% of the respondents answered that they use projections for planning investment in plant and equipment. Next in line, with 46%, was planning of "output levels"; with 15%, for "inventory policy"; and 13% for "financial investment programs." To satisfy these various objectives, market analyses must be used—analyses of the market for a firm's own products as well as those of its competitors, the markets of customers and of suppliers, and capital and labor markets. Projections make it possible to examine developments in these markets not only as they were last year or yesterday but as they are likely to unfold in the future. Projections provide the perspective, the frame of reference, for a dynamic market analysis.

To be useful for market analysis, projections should be broken down in detail by industry, by product, and often by region. Such a detailed break-down, however, is not always feasible. A projection of a specific product is fraught with much more hazard than a projection of GNP totals or major GNP components.

Also, the people best equipped to make estimates of the major economic factors are not likely to possess the detailed technical knowledge needed to evaluate markets for specific products.

For this reason, long-range business planning should combine the efforts of economic generalists with those of the specialists in the particular industry.

Long-range projections for business planning can be thought of as the product of two estimating procedures, one from top down and one from bottom up. (The term "from bottom up projection" has been used by David Melnicoff of the Pennsylvania Railroad.) The first of these is to project, for example, the trend of the over-all economy and then estimate the impact of this trend on spending by consumers, business, and government. From these estimates, it is possible to estimate the outlook for major industrial groups. The other method is to proceed from the plans of specific companies and industries to larger units.

The question as to how far down in detail the generalist should go and how far up in the aggregate the specialist is equipped to go cannot be answered in general terms. In some instances general economic projections can contribute little to business planning. There are companies, particularly those producing a new product, for whom future markets depend more on the result of a competitive struggle than on the development of the economy as a whole. In appraising future market prospects for such companies, the specialists have more to contribute than the generalists. The economic generalists can contribute little to the prediction of the long run market for hula-hoops, for example. In appraising the market outlook for most industries, however, both questions must be answered, *viz.*, how will their market be affected by the growth of the economy and how will they fare in competition with other products which may serve as substitutes. Each industry specialist must decide how much of

the generalists' projections are relevant to his industry's market analyses while the generalist must decide which of the industry analyses will influence his projection.

Some business executives may feel that the industry specialist really is best equipped to provide the necessary projections, because all he needs to know from the generalist is whether the economy is likely to grow by an annual average of 2% or 3% or 4% or any other such magic figure. However, simply estimating a

Furthermore, even the major components of GNP never move in the same proportion over a number of years. For instance, from 1952 to 1957 the share of consumers' purchases in the GNP increased from 63.3% to 66.3%, and the share of government purchases declined from 22.2% to 18.6%.

It is obvious that the projection for a specific industry will vary greatly depending on both the growth and the composition of the GNP. In order to explore various possible patterns

TABLE 2
DISTRIBUTION OF NATIONAL EXPENDITURES FOR GOODS AND SERVICES
(Per Cent)

Type of Goods and Services	Actual Distribution			Projected Distribution			
	1929	1946	1956	1965 Alternatives			1965 Judgment
				I	II	III	
Households	75.5	70.1	64.4	68.9	66.5	62.4	64.8
Domestic and foreign investment	16.3	15.2	16.2	13.4	16.0	13.6	15.3
Government	8.2	14.7	19.4	17.7	17.5	24.0	20.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: The alternative models for 1965 represent conditions of full employment characterized by high consumption (Alternative I), high investment (Alternative II), and high government (Alternative III) activity; the judgment model represents our evaluation of most likely distribution for 1965.

Source: 1929-1956: *Survey of Current Business*, July 1958;
1965: National Planning Association.

probable rate of growth during some specific future period in itself requires detailed work on the prospective growth of the labor force, on the likely development of labor participation rates, and hours of work, on the rise in capital equipment, and output per manhour. Many assumptions—explicit as well as implicit—are necessary in order to calculate a reasonable figure or a reasonably narrow range for a plausible maximum and minimum GNP.⁴ Slight differences in basic assumptions can result in wide differences in the projections.

⁴ The Rockefeller Report, *The Challenge to America: Its Economic and Social Aspects*, Special Studies Report IV (Garden City: Doubleday & Co., 1958), computes for 1967 (in 1957 prices) a GNP range between \$583 and \$707 billion. Such a range may be adequate for the purposes of the Rockefeller Report but would be much too wide for a projection which could be used for business planning.

of economic growth a number of alternative models have been computed for 1965, each assuming approximately full employment, and each of which can be regarded as internally consistent. These alternatives are then used as building blocks for computing the most plausible model, which we call the "judgment model." The judgment model incorporates the most plausible judgment with regard to the development of government policies and business and consumer behavior. Table 2 shows the differences in the composition of GNP in recent years and in alternative computations for 1965.

The market prospect of any specific company or product should be seen in the perspective not only of the over-all GNP rate of growth but of growth of the component parts to which

it is most closely related. For example, a projection for steel or aluminum should not be based solely on a relationship between GNP and steel demand. Rather it should use the relationship between the demand for steel to demand for construction, machinery, durable consumer goods, major defense items, and so on. Besides these relationships, the industry specialists will need to consider the likelihood of the substitution of steel by aluminum and other metals, or the substitution of lumber by steel.

Therefore, our answer to the question posed in the title should be modified by saying that long-range projections of GNP for business planning are more useful if a somewhat detailed breakdown can be provided. GNP projections should as far as feasible identify major economic sectors both by products and by regions.

The phrase "as far as feasible" is, at the present time at least, a substantial limitation. Refined projections (*e.g.* for industries falling within the 3-digit code of the Standard Industry Classification) could best be done by the use of interindustry (input-output) tables of the kind which were computed by the federal agencies for the year 1947. Such input-output tables permit computing the effect of changes in major GNP components (final demand categories) upon specific industries and products. Unfortunately, no up-to-date input-output table is available or in preparation. Therefore, one has to rely for the time being on correlation analysis and other methods for establishing relationships.

The input-output tables for 1947 incorporated much of the knowledge of the industrial specialists and made that knowledge available for general economic projections. In the absence of more recent calculations a greater part of the burden of this work falls on the industry specialists. Also, the general statistical information for various regions is at present so deficient that the preparation of

regional breakdowns requires considerable effort and is fraught with greater projection hazards than for the nation as a whole. Nevertheless, some work on regional projections has been undertaken and more can be done with the available information. Here also regional specialists have to work hand in hand with the national generalists.

The discussion of the respective role of the economic generalists and the industrial and regional specialists suggests that the use of a general economic projection must be part of a comprehensive effort of business management. Business management will continue to rely upon experts or consultants who have the specific knowledge which relates the market outlook for a specific product to the broader categories of economic activity covered in the general projection. Long-range projections, in other words, are no inexpensive substitute for specific expert advice, but rather are a tool which enable the specific expert to give better advice.

Moreover, projections are not a substitute for the exercise of management judgment concerning the future.

All business decisions for the future must be made under conditions of uncertainty. Projections should be so presented that they do not imply a certainty which does not exist. This can best be achieved by presenting alternative estimates which give both high and low estimates for the GNP totals and alternative compositions. For many industries, for example, it makes a great deal of difference whether a rise or a reduction in defense spending is expected. There are also different courses of legislation on taxes and other government programs and different attitudes on the side of business and consumers which lead to different compositions in the GNP structure. Such differences have their impact on the prospective markets for products, labor, capital and also for various regions.

The business executive often seeks an "ob-

jective" computation as the basis for a decision. He may find it difficult to make decisions if the economist presents him only with "alternatives." However, most business executives not only prefer to see these alternatives but also like to have the best judgment of the projection estimator as to what he personally regards as the most likely course of events. By selecting a limited number of reasonable alternatives together with a "best judgment" evaluation, the business user can judge what consequences follow for his markets and costs from such different assumptions. Since the presentation of alternatives reflects the actual state of economic uncertainty, the economist should insist on presenting them to the business executive—possibly combined with his own recommendation as to what are the best guides for decision-making. However, the method of presentation should make clear that no projection can take the place of the judgment which must be exercised by the responsible business executive.

NEED FOR IMPROVEMENT

The art of systematically computing long-range projections has been practiced now for about 15 years. This is a relatively short time indeed, and it is not surprising that economists and statisticians practicing this art, and business managers using projections still have a great deal to learn. Preparing long-range projections depends on the statistical raw material which is processed and interpreted in a specific systematic manner. The statistical data needed for this particular purpose are still deficient. Long-range projections are largely expressed in terms of national economic accounts, specifically national income and product accounts. These are highly developed in the United States and the improvements needed are largely of a technical nature.

However, national balance sheet accounts and interindustry (input-output) accounts are necessary at least as auxiliary material. In this

respect the statistics program in the United States is behind the achievements in other countries.⁵ Interindustry statistics are useful for preparing projections for specific industries and products consistent with more general GNP projections. Balance sheet accounts, that is, estimates of assets and liabilities, are useful for establishing relationships between stock of physical capital, net increases in capital equipment, production capacities, and productivity. At the moment econometricians can propose the most elegant formulae for the conditions of "balanced" economic growth, but they are at a loss when they are asked to translate mathematical symbols into actual quantities. When it comes to an appraisal of productivity development, we have only inadequate knowledge of the technological and managerial factors which may promote or impede the rise in productivity.

Over the last 50 years statistics have, to a considerable extent, been tailored to meet the needs of describing past market experiences. The growing importance of projections, that is, dynamic market analysis, has not yet made a corresponding impact on economic statistics. It is hoped that through the efforts of such organizations as the Federal Statistics Users Conference, the government and other producers of statistics will come to recognize the imperative need to meet these requirements.

Besides the need for more adequate data, there is need to improve our methods of processing these data, that is, of computing projections. There are now a few research groups engaged in the exploration of improved methods. The National Planning Association, for example, hopes in a short time to publish some results of its recent research efforts in

⁵ See: "The National Economic Accounts of the United States. Review, Appraisal, and Recommendations by the National Accounts Review Committee of the National Bureau of Economic Research, June 1957." In: U. S. Congress, Joint Economic Committee, Subcommittee on Economic Statistics, *National Economic Accounts of the United States*. Hearings, 85th Congress, first session (Washington: October, 1957).

this field. Other organizations are working along somewhat different lines. This is certainly an area in which competitive effort is welcome.

Finally, but probably most importantly, business—as well as government, labor, and other groups—must learn to use projections

and make them an integral part of their tools for planning or, more exactly, programming. As with every new tool, there is use and misuse. Nothing will discredit a new tool as much as its misuse. That is why I am taking this means to point out some of the uses and limits of projections as a tool for business planning.

The true epic of our times is not "arms and the man," but "tools and the man," an infinitely wider kind of epic.

Thomas Carlyle

GEORGE A. STEINER
L. EUGENE ROOT

Linear Organization Charts

If you have a planning-authority problem, you will be interested in seeing how a division of Lockheed solved theirs.

Authority relationships, as all managers know, can rather easily become entangled and create difficult problems. This is especially true in organizations that are rapidly expanding or for other reasons are undergoing swift changes. This article describes a method which was used with success in dealing with this type of problem at the Lockheed Missile Systems Division, Sunnyvale, California. It is presented with the hope that others may find fruitful uses for the tool adopted. In addition, since the problem centered in an important planning area, the authors feel the array of functions developed in examining the issues may be helpful to others faced with the organization of a comparable planning group.

BACKGROUND OF THE PROBLEM

The Lockheed Missile Systems Division was organized at Van Nuys as a Division of the Lockheed Aircraft Corporation in January 1954. In 1956 the principal offices of the Division were moved to Sunnyvale, California, and during the next year one of the authors was named Vice-President of the Corporation and General Manager of the Division. The setting of the problem discussed is mid-1957.

The Missile Systems Division is one of five

major Divisions of the Lockheed Aircraft Corporation. The Division is engaged in the business of missiles weapons systems management from research and development, through production, component scheduling, and finally through flight testing of missiles and space vehicles. There are presently several major contracts being performed, of which the most widely publicized are the Polaris Submarine Launched Solid Propelled IRBM, the Air Force Satellite Project, the X-7 Supersonic Test Vehicle, and the Kingfisher Missiles Evaluation System. The Division has shown a rapid expansion since its creation. Sales rose from \$53.2 millions in 1956 to \$76.2 millions in 1957. Professional personnel increased from 1,157 to 1,732 in the same period. Many, but not all, managers of the Division have been recruited from other parts of the Corporation.

The new Vice-President and General Manager created a Product Planning Branch with authority to carry out a variety of planning activities. At the same time, of course, in an organization which must be so conscious of future programs, many other groups and officers were involved in a variety of planning efforts, aside from detailed planning specific to technical research and development programs.

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These planning activities were closely interlocked and the lines of authority were not always clear. The problem created was compounded, paradoxically, by the emphasis which the Lockheed Aircraft Corporation has placed upon forward planning.

The organizational setting of the Product Planning Branch in mid-1957 is shown in Charts 1 and 2. Because of many changes and improvements which were made to accommodate the rapid growth of the Division, the organization chart of the Division looks much different today. But this knowledge is not important to the conclusions to be drawn from this study. It is sufficient to note that product planning, in a broad sense, was a necessary part of the operations of organizations other than the Product Planning Branch. In addition, work of the Division as well as the Product Planning Branch was intimately related with planning activities of the central Lockheed Aircraft Corporation.

Consequently, the Product Planning Branch found itself with a formidable job in carving out and pursuing a variety of planning activities in which most of the other top staff of the Division had varying degrees of interest. In rather simplified terms, the problem of the Director of the Product Planning Branch, and the one discussed here, was to define the specific planning activities for which he was responsible, to clarify interests of other offices in his activities, and to understand planning activities of others in which he had an interest.

The method adopted to solve the problem resulted in the linear organization chart shown as Chart 3. New developments affecting the planning problem since 1957, when the work described in this article was done, have been rapid. Although the methodology and functional arrangements described here have been the basis for coping with some of the new developments, the material presented here does not fully reflect conditions today. Again, how-

CHART 1

LOCKHEED AIRCRAFT CORPORATION MISSILE SYSTEMS DIVISION

April 1, 1957

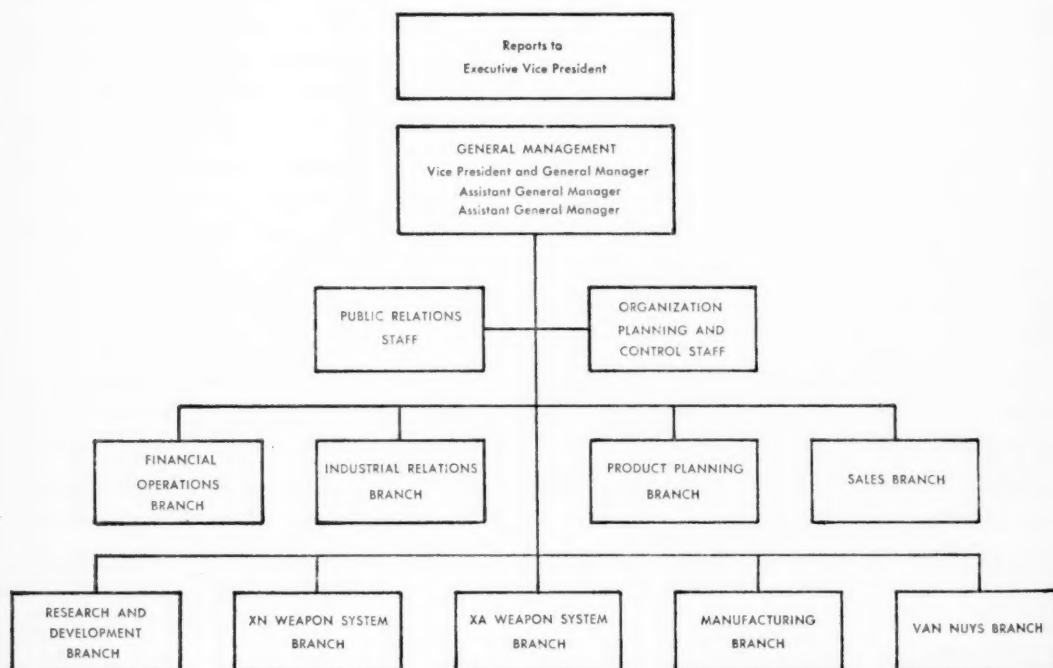
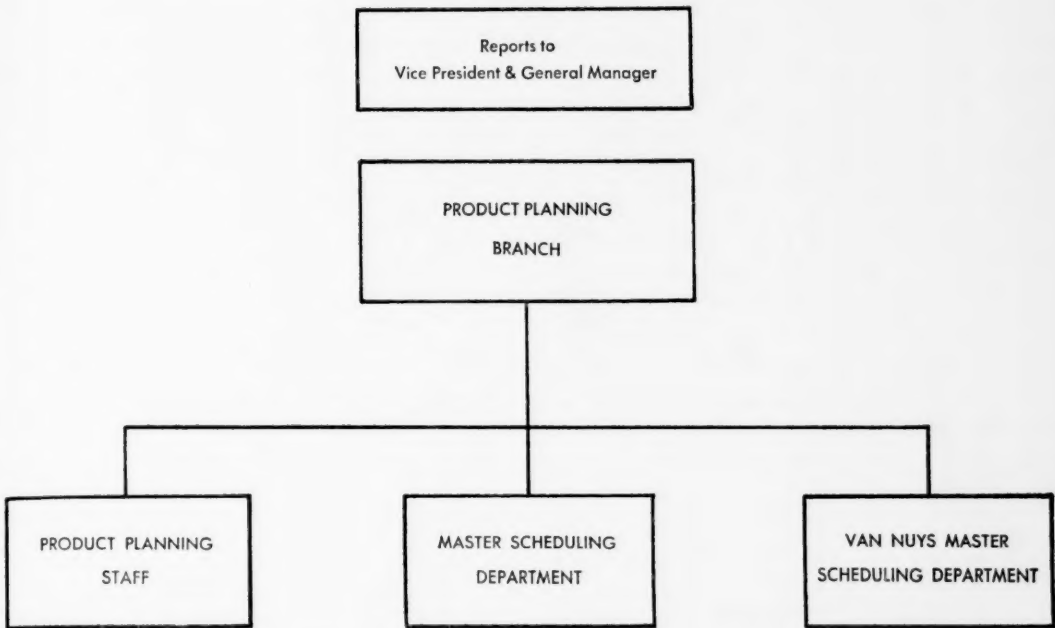


CHART 2
 LOCKHEED AIRCRAFT CORPORATION MISSILE SYSTEMS DIVISION, PRODUCT PLANNING BRANCH
 April 1, 1957



ever, this updating is not critical in appraising the following description of linear organization charts. Indeed, it would unnecessarily complicate the story. But it is pertinent to note that the Product Planning Branch is now the Plans and Programs Branch, reflecting a broader conception of the work of this central group than when it was created.

CHARTING PLANNING FUNCTIONS

Naturally, the first step in untangling the planning relationships was to find out who was doing what in planning that related to the area of interest of the Product Planning Branch. A manual of job specification and function for all offices, which had been recently completed by the Division, was most helpful and, when supplemented with personal discussions, revealed sufficiently the planning activities as they actually existed.

The next step was to array planning duties with which the Product Planning Branch should be concerned, whether carried on by the

Branch itself, in conjunction with others, or performed by others with the Product Planning Branch. This proved to be a difficult conceptual task. In preparing the functions it was necessary to keep in mind many such factors as (1) responsibility and authority which the Director of the Product Planning Branch should have; (2) needs of top management in the future for specific types of planning data; (3) planning authority in other Branches; (4) coordination of planning activities among Branches to provide most efficiently the information needed by top management; and (5) ability of staff to pursue various planning activities in light of personnel and time limitations. The results of this work are shown on the left side of the accompanying linear organization chart (Chart 3).

The planning activities of the Product Planning Branch were divided into the following categories: (1) developing data by means of which top management could clarify in specific terms objectives and directions of effort; (2)

LOCKHEED AIRCRAFT CORPORATION
MISSILE SYSTEMS DIVISION—PRODUCT PLANNING BRANCH

PLANNING FUNCTIONS, TYPE AND EXTENT OF ACTIVITY, AND ORGANIZATIONAL RELATIONSHIPS

AUGUST, 1957

[illegible]

3. ¹⁷ Customer procurement policies.

5.1. Market conditions for new products

FOR PLANNING

- A. Developing Broad Environmental Trends and Forecasts
 1. Political, economic, and military trends
 2. Military mission expenditures
 3. Change assessment policies
 4. LMSD competitive environment
 5. Market conditions for new products.

- B. Establishing Basic Assumptions for Planning:
 1. Quarterly forecasts of operations
 2. Five-year financial forecasts
 3. Annual budgets
 4. LMSD operating plans

III. PREPARING PLANS TO REACH OBJECTIVES

- A. New Product Development

1. Strategy for preferred areas
 2. Measuring new ideas against policy
 3. Screening for final recommendation
 4. Evaluating results

- B. Abandoning Present Product Lines

- C. Quarterly, Semi-Annual, Annual, and 5-Year Financial Forecasts

- D. LMSD Operating Plans

1. Laying basic assumptions
 2. Preparing basic data
 — environmental forecasts
 — physical facilities
 — financial data
 — technical data
 — manpower data
 — personnel data
 — sales data
 3. Evaluation of data
 4. Choosing among alternatives
 5. Recommending action

IV. EVALUATING OPERATIONS AGAINST PLANS AND OBJECTIVES

- A. New Product Operations

1. Against basic policy and objectives
 2. Against plans established for them
 3. Against LMSD resource capabilities

- B. Resource Utilization

1. Physical facilities
 2. Product schedules
 3. Manpower
 4. Inventory
 5. Financial
 6. Management availability

- C. Special Reports

1. Performance measurement methods
 2. New procedures to assure performance in conformance with plans and objectives

V. MAINTAINING GENERAL MANAGER CHART ROOM

LEGEND

Directs or Performs Job Itself: to give orders or instructions
Works with Others: to act as a principal in collecting information and data from other offices and organizational units. (This activity varies from formal "task force" arrangements to informal cooperative efforts. The "team approach" was found to be effective and essential in completing a number of planning operations.)
Coordinates: to bring into a common action the work of personnel in other Branches to achieve a given objective; to unite work of other Branches into a unified whole to achieve a given objective.

Evaluates: to review, or appraise action or performance.

Liaison: to establish a bond or connecting link with other organizations to establish a special channel of communications.

Participates: to share a given task in common with others.

- (1) Product Planning Branch initiates action (does not necessarily mean exclusively).
 (2) Product Planning Branch participates in action initiated by others.
 (3) Product Planning Branch reviews and evaluates work performed by others.
 (4) Product Planning Branch action is requested by others.

providing forecasts of environmental conditions needed for short- as well as for long-range planning; (3) preparation of product plans required to reach objectives; and (4) evaluating operations against plans and objectives. A fifth category, maintaining a chart room for the General Manager, was set up to meet a special situation. These activities are listed down the left-hand side of Chart 3.

Most of the categories of functions under each of these heads, as noted in Chart 3, are self-explanatory. It should be emphasized that these functions clearly did not duplicate or interfere with scientific and engineering technical planning activities associated with the development of the various contracts held by the Division at the time. Indeed, the functions were developed to supplement and facilitate the work of the technical project managers as well as to provide additional over-view planning information for top management.

The next problem, naturally, was to determine who did what with respect to the planning functions set forth. The solution is shown in Chart 3. In columns (2) through (7) is indicated the type of activity that the Product Planning Branch performed with respect to each function given in column (1). More than one number appears in some of these columns. This is because some of the functions listed in column (1) are in practice subdivided further than shown on the chart. Variations had to be permitted to accommodate these particular details. They are omitted from the chart to permit easier presentation here.

In columns (8) through (21) are listed other offices and groups having an interest in the activities of concern to the Product Planning Branch. The letter "X" in the columns indicates only some degree of participation in the planning activity. It is not practicable here, nor necessary, to show the precise degree of participation because of the variations which inevitably occurred with different actions under each function. But such degrees of partici-

pation could readily be marked on this kind of chart by appropriate numbers or symbols or spelled out in organization manuals. In addition, it would be entirely possible to indicate percentage of time spent by various personnel on the different functions. These are refinements which a user of such a device can readily make.

OTHER ORGANIZATIONAL ANALYSES

The Serge A. Birn Company, Louisville, Kentucky, consulting management engineers, is often recognized as first introducing this tool into the United States. This company credits the technique to Ernst Higmans, a Netherlands consulting engineer, who perfected a more complicated, but similar diagrammatic device.

Mr. Birn's method is called the "Linear Responsibility Chart." We prefer the title "Linear Organization Chart" simply to avoid semantic problems posed by the words responsibility and authority. Although the idea described here, as applied to the Lockheed Missile Systems Division, is similar to the "Linear Responsibility Charts," the authors did not exactly follow Mr. Birn's charting methods.

In a letter to one of the authors, Mr. Birn noted that his charts have been used among a wide variety of companies and for a variety of problems.¹ These have included the development of an ideal organization to compare with existing organization; redistribution of important responsibilities among major departments; reduction of overhead cost, analysis of procedures, administrative management requirements, and budgeting in a multiplant corporation; redistribution of executive responsibility from the President on down the scalar chain; pin-pointing responsibility for quality; conversion of multiplant to single plant opera-

¹ *Business Week*, in an article on "Mapping the Executive Setup," April 6, 1957, p. 188, observed that about thirty U. S. companies had used the chart up to that time and an additional fifty were reportedly looking at it seriously.

tion; review of paper work from receipt of order to shipment; coordination between production and general management; and improvement of control and reduction of operating costs.

There are a number of techniques available to management to improve organizational relationships. The most widely used are organization charts, the most usual of which is the pyramid chart, and organization manuals with detailed specifications of job functions and duties. Can these tools be eliminated by linear organization charts?

The Serge A. Birn Company believes that the Linear Responsibility Chart can replace pyramid organization charts as well as bulky organization manuals.² Some users of the plan reportedly feel it will replace existing organizational manuals and charts.³

There is no doubt about the fact that the one-page chart does summarize conveniently, quickly, compactly—and visually—masses of information included in the typical organization manual. In addition, it seems possible that such charts can also define more concretely specific authority and responsibility than the organization chart and typical manual. The English language is extremely flexible; words mean different things to different people. Writers of job descriptions therefore can become rather expert at confusing duties by choices of words.

Of course, linear organization charts cannot have the mathematical precision of quantum formulae. But by insisting on similar definitions for degrees of authority and responsibility among all functions and actions, uniformity and understanding of duties can be clearly set forth. And, as noted above, it is possible to refine the chart with quantitative

² Alfred G. Larke, "Linear Responsibility Chart—New Tool for Executive Control," *Dun's Review and Modern Industry*, September, 1954. Also, letter to one of the authors dated October 13, 1953.

³ Letter to prospective students in a seminar on the subject mailed by Loyola University, February 22, 1956.

analysis at least in terms of percentages of time spent on functions.

In treating the question of substitution of linear responsibility charts for other organizational tools, the Corning Glass Works, Corning, New York, a satisfied user of this method, notes:

It does not replace (other) accepted techniques of functional and organizational control. Rather, it is an important supplementary tool which supervisory and other management individuals can use advantageously because it affords the opportunity quickly to scan and assess the actual relationship which exists between an operating group's employees, their functions, and their workloads.⁴

Other users of the device have come to the same conclusion.

Because organization charts and manuals perform other useful functions which linear responsibility charting by its very nature cannot do, it is doubtful whether they should be supplanted by the newer tool except in rare instances. This conclusion applies to the Lockheed Missile Systems Division.

USES

The idea behind linear organization analysis charts is quite simple. No doubt should arise about the utility of such charts merely because the idea behind them is so simple. There are a wide variety of proven uses for the tool:

1. *Make Management-Audit.* The graph presentation can, by avoiding entanglement in the language thickets of organization manuals, probably make clearer who-is-doing-what. The process of analysis is speeded and simplified. There may be, therefore, a cost advantage not only when outside consultants are making the audit but also when internal audits are made or new executives begin to get acquainted with their environment.

2. *Reveal Organizational Shortcomings.* While such charts are not an open-sesame to all organizational problems, they can effectively spotlight a variety of existing and po-

⁴ Larke (see Note 2).

tential difficulties. Troubles arising from the following types of situations may be revealed by such analyses: confused decision-making authority; overlapping authority; authority without commensurate responsibility, or vice versa; too many or too few participants in specific decision-making processes; poor communications; too much or too little time spent on particular functions; by-passing executives; vague assignments not thought-through and not broken down into specific duties; and lags between new organizational requirements and existing assignments.

3. *Clarify New Assignments.* Most companies are continuously in the process of making changes which affect organizational relationships. Groups of personnel are reorganized, new executives appear, new assignments are made, and in many other ways authority relationships alter. Paralleling such changes is often a continuous succession of new organization charts and manuals of job descriptions. Linear organization charts can be helpful not only in preparing for the new changes, but also in clarifying organizational relationships at the time of change.

4. *Improve Control.* Control over many different types of activities can be improved by specifying clearly those subordinates to whom authority is delegated for specific actions. In addition, comparisons of performance and method are possible among units working on similar jobs in multiplant companies. The Corning Glass Works, for example, first used this tool to find out how many accounting methods were in use among plants and how long they took. Having discovered wide variations in method and process time, the company planned a standardized accounting system.⁵

For such an adaptable and versatile tool, other possible uses may suggest themselves. How many new uses develop will depend much

upon the extent to which executives explore the device.

LIMITATIONS

As intriguingly useful as the method has proven to be in a number of situations, it cannot in its present state of perfection answer all problems of organizational relationships. It probably never will achieve such potential.

Such charts cannot by themselves solve problems created by poor organization, vague assignments, poor communications, and other organizational difficulties. The best the charts can do is to highlight such difficulties. Once the problems are resolved, the charts can make the solution clear to all concerned. But other methods also can do this. Whether they can do it quicker and easier than such charts depends on particular circumstances of their use.

It should not be inferred from what has been said here that linear organization charts can always define clearly and unequivocally exactly who does what in a corporation. It is doubtful whether this can be done for complex organizations, except in a very general way. Influence, the exercise of authority, and residual power depend much on personalities, political arrangements, interests, and systems of communication. These change from time to time and from situation to situation. An effective staff member, for example, can control more decisions than he may often be given credit for. Indeed, his influence may depend upon his anonymity. Formal organizational charting arrangements can hardly mirror all such situations.

In the hands of the inexpert these charts may not only fail to achieve their full potential but may also compound existing confusion. For example, inept specification of categories and functions to the left of the chart may inhibit necessary analysis and smoke-screen trouble-spots. Failure to include all functions will also raise problems.

⁵ "How to Know Who Does What," *Mill and Factory*, January, 1955, p. 78.

For best results the following steps should be followed and each performed with considerable care:

- Examine the problem to be resolved.
- Study existing relationships.
- Define functions and relationships to be charted.
- Prepare chart.
- Secure understanding and acceptance of the chart among those affected, or requesting it.
- Use the chart for the purpose designed.
- Modify the chart on the basis of experience.

The charts are tools; they do not replace careful thought about problems. Tools are designed to augment skills. When a tool itself is given greater emphasis than the skills it serves to improve, too much credit is given the tool.

Lawrence A. Appley wisely underscored this point when he said: "In discussing organization structure, we frequently use organization charts, position descriptions, activity analyses, work-flow charts, and other tools for clarifying responsibility and authority. Often these techniques get blown up out of all proportion as compared with the importance of the thinking processes they generate. An attempt to clarify

the functions and the relationships of people within a group necessitates thought that otherwise would not take place. The position description, therefore, does not clarify organization so much as it clarifies thought. The thought is better because of the use of the tool."⁹

This is precisely what occurred with the use of this method at the Lockheed Missile Systems Division. The thought provoked by the use of the tool was far more important than the chart itself, as important as that proved to be in improving organizational relationships.

CONCLUSION

Linear organization charts are an effective tool for picturing, clarifying and correcting many types of problems growing out of or centered in authority and responsibility relationships. One variation of the method was used with valuable results by the Missile Systems Division of the Lockheed Aircraft Corporation in treating a problem of the Product Planning Branch. Other corporations have found the device useful. Although it has not yet eliminated, nor does it promise soon to eliminate, other means for clarifying organizational relationships, it is a handy supplement to the methods now generally employed.

⁹ *Management News*, American Management Association, May, 1958.

The use of a thing is only a part of its significance. To know anything thoroughly, to have full command of it in all its appliances, we must study it on its own account, independently of any special application.

Goethe

E. T. GRETHER

Organization for Industrial Development in California

How could a centralized state-agency help local industrial development groups in California offer and promote a "competitive product?"

Throughout the United States, energetic groups have sprouted spontaneously to meet urban and rural problems and to attack the issues posed by industrial development. It has been estimated, in fact, that there are some 13,000 such groups (a healthy sign indeed for our democracy, which must have a strong footing in local organizations and activities). But of particular interest for this discussion is just one aspect of community organization and activity: industrial and economic development.

In California, and other states, too, enormously varied interests have organized to promote economic and industrial development. These groups reflect the individual and local community initiative of all citizens, as well as of private, political, and semipolitical agencies. It is true, of course, that much—perhaps most—economic development and expansion arise almost spontaneously from the forces of private enterprise without any apparent push from formal organizations. But almost all communities (with notable exceptions) are ambitious to expand employment and economic opportunity; these communities often undertake some organized programs, effective or ineffective, good or bad, to achieve these ends.

Often such efforts are the responsibility of the local chamber of commerce, of the local governments, or of a combination of private and public efforts more or less coordinated. The purpose of this discussion is to suggest the contribution that a state-wide agency could make to the efforts of local decentralized groups in California working for the economic development of their communities.

REQUIREMENTS FOR BALANCED ECONOMIC DEVELOPMENT

A logical starting point for the discussion is to review what is necessary for successful efforts toward industrial development at the local level. The general objective of such groups is frequently stated as "balanced" economic development. Although the term "balance" is rarely defined, the context of such statements usually suggests that the group hopes to attract and keep businesses and industries which will provide an adequate tax base to support community facilities and programs which do not themselves directly produce revenue. (For example, the newer residential suburban areas populated by young, growing families face a serious problem in providing adequate educa-

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tional facilities—let alone other community services—if they have only a residential tax base.)

Of course many factors determine whether economic development groups are able to attract the enterprises which will contribute to this objective. Among them are (1) the competitive efforts and opportunities offered by other communities, (2) the relatively spontaneous response of some types of economic activities to the expansion of population or to the establishment of new industrial plants, (3) the relative prosperity of the economy at large, and (4) the basic industrial trends in the community and the region (that is, local economic development is influenced by numerous interdependent factors that do not remain static, but change over time).

In light of all these things, groups are often at a loss to evaluate the effectiveness of their own efforts. It is possible, however, to isolate some of the requirements for a sound program of economic development at the local level.

A competitive product. The first essential for a successful economic development project is that the community offer a sound product to business and industry. Furthermore, local development groups must know their product's characteristics and its promotability. In industrial development programs, the product is chiefly industrial and economic opportunity—large or small.

If the opportunities are small and limited to the local market, then probably little advance planning and promotion are necessary, for the response is most likely to be relatively spontaneous by local private capital and enterprise. Retail stores, service trades, restaurants, filling stations, and the like may be expected to appear wherever there are people to spend money. Similarly, the establishment of a new primary industry will attract the complementary allied industries and services. The new jobs and income thus generated in the community will in turn result in the relatively spon-

taneous increase of goods and services required locally. There are, however, very complex problems in planning and promotion when the objective is to attract industries that will sell beyond the immediate community and that use the local site merely as a base of operations into a larger market.

These industries provide jobs, pay taxes to the community, and in general raise the local level of prosperity. Owners of land, established businesses, real estate operators, builders, workers, and many others stand to gain when a new industrial plant enters a community, or when an established one expands. The competition among communities for industries is consequently both energetic and strong. The product that the industrial development group is selling, then, must stand the test of free competition.

We must assume that industrial development programs reflect competition that is free and open, as in industry, and within the rules of the game. Whenever communities try to attract industry by such devices as tax exemptions, free land or buildings, and other forms of artificial subsidy, there is a strong suspicion of basic weakness in the product. It is likely that the community is attempting to lure business to make unwise choices in location, because the community cannot offer much in the way of economic opportunity. If it became widespread, community competition in the form of "give-aways" would surely point towards state or national regulation of the use of resources in wasteful forms of industrial promotion.

Most likely, very few firms are seduced by subsidies and unfounded puffing. It is even possible that the proffer of subsidies may cause them to doubt the opportunities of the community. (Of course, this is not to say that businesses are not happy to accept subsidies after they have selected a site for other reasons.) Similarly, communities may well be suspicious of the character of enterprises easily seduced by such subventions.

There is a strong suggestion of some general competitive weakness also when any community must resort largely to public agencies in other than advisory, informational, and catalytic capacities in order to promote or develop industries.

A given location is competitive when it can offer either advantages of supply (as raw materials and labor) or advantages in marketing and selling. Such a site can get and hold business. Sometimes the exact site is almost pinpointed by the location of the deposits of the materials (i.e., for an industry that is "resource-bound"). Almost always, however, there is some flexibility within at least a narrow zone for locational choices, and some industries are entirely "footloose." Thus, firms are susceptible to a variety of economic advantages offered by competing communities.

Among the important product characteristics which make a site competitive are essential community services and facilities. The satisfactory operation of an industrial plant requires all or some of the following facilities in addition to access to the materials, labor supply, and fuel essential to its operations: water, waste disposal, transportation facilities, fire and police protection, housing and schools for workers and their families, and adequate and reasonable local governmental regulations, especially zoning. Other things being equal, variations in these general community facilities may determine the choice to be made by a firm shopping for a good location.

Perhaps the only true economic role of subsidization would be to compensate an industrial firm through lower site costs for providing some of these facilities when the community does not do so. Such compensatory subsidies obviously are not *net* subsidies. To say this, however, is far different from arguing for artificial subsidies, because such facilities in themselves should be part and parcel of the essential services which the community has to offer.

One need only look beyond the Iron Curtain to reaffirm the importance of free competition among communities bent upon industrial development. Among the many causes of unrest and outbreaks in the Russian satellites are the effects of ill-considered locations of industrial plants. Hungary, Czechoslovakia, and Poland, it is said, are studded with Stalin's industrial white elephants—great plants without nearby raw materials—whose products are able to compete in world markets only by exploiting workers through lower wages. It is fortunate, indeed, that industrial plant location in the United States, except for certain defense industries, must stand the rigorous test of ability to compete in our great internal free trade markets. We cannot remind ourselves too often that this factor is perhaps the largest single influence making for our high standard of living and high prosperity. Consequently, we must guarantee that competition in industrial development between communities remains free of artificial subsidies.

A new industrial plant selling into a regional or larger market should, and normally will, add more to the community than it gets in direct services and facilities, otherwise a mistake in location has been made by both sides. There has been a blunder unless a new industrial plant or the expansion of an existing one raises the level of income and the standard of living in the community. Under our free system of location and local, regional and national free trade, such blunders will be liquidated ultimately by the forces of competition, which will force either closing the plants or shifting them into second best uses, after the appropriate markdowns of equities and losses to investors. And this is fortunate, indeed, because the alternative would be subsidies at the general expense of the standard of living, either through higher taxes or lower wages.

In short, the balanced economic development sought by industrial development groups requires that they promote a competitive prod-

uct, sound economic opportunity within or outside the community. A community does not in fact "bring in" industry; rather, it provides the setting and conditions for economic opportunity. Hence, the task of each community is to understand clearly and try to sell its particular *competitive economic opportunities*. But these opportunities, like other products, of course, may require some packaging and special services, *i.e.*, general and special community services and facilities.

Local economic development groups must, *first*, see to it that the basic community services and facilities are adequate; *second*, call the opportunities in the community to the attention of prospective enterprises; and *third*, assist active prospects to work out their local arrangements, if desired.

It is most important, also, in industrial development work to provide full, accurate, basic information about the community. It is for this reason, for example, that the Industrial Plant Location Committee of the California State Chamber of Commerce several years ago sponsored the Standard Industrial Survey Summary Reports for California Communities. These reports provide data on climate, transportation, industrial sites, industrial water supply, utility services and rates, governmental facilities and taxes, population and trends, employment, characteristics of the labor force, wage rates, housing, community facilities, and existing manufacturing.

The need for coordination. Sizable industrial development projects often run into short-run obstacles or insuperable barriers posed by the fragmentation of the larger area into a great many small political units vastly different from one another in size, circumstances, and ambitions. (For example, there are 391 and 401 local governmental units in the Los Angeles and San Francisco metropolitan areas, respectively.) Important as competition is for industrial development, coordination and cooperation among communities trying to develop

further is also important. And, paradoxically, such coordination is often important to the abilities of these communities to offer a competitive product.

Communities, like business firms and individuals, have differing personalities and varying objectives—and properly so. Hence products available for industrial development may be expected to vary widely, depending upon the wishes as well as the circumstances of any single political division or combination of local divisions. Some communities will not wish certain types of industries (as heavy industry); hence, they will not choose to develop the appropriate facilities and conditions and may even erect insuperable barriers to entry. (For example, it is to be hoped that Stanford's lovely acres may not eventually be studded with unsightly and poorly landscaped factories, warehouses and industrial dumps. Presumably the restrictions are such that industrial plants on the Stanford campus will look like college halls and laboratories.)

In a democratic society, communities, like individuals, should of course be given reasonable freedom to work out their own ends; but broader general objectives may require some adjustments and adaptations. To mention this brings us to a major problem in the accomplishment of "balanced" economic development. Unlike the horse-and-buggy days, when the local farm trading center, which tied the town and agricultural countryside together, acted as the economic coordinating center, today there is no typical community pattern. Rather, great metropolitan clusters of economic activities are emerging, often without the coordinating benefit of a clearly dominant economic center.

Economic balance in these emerging clusters and within the individual communities making up the clusters must be related to the area as a whole (such as the San Francisco Bay Area and the city of Berkeley within this area or Los Angeles County and the city of Los An-

geles and its numerous thriving affiliated cities.) A single local community can never be in balance for very long in a dynamic, growing industrial society. The issue of balance is the question, really, of how the economic development of any given community is to be related to that of its environment: the other communities around it and the other communities of which it is a part.

Reasonable balance can be gained and held for any community only if thinking, planning, and programming transcend the legal limits of local political boundaries. The current controversies over smog control, waste disposal, water, and rapid transit punctuate this observation most dramatically.

Ideally, what is required is that all local communities do an effective job of internal appraisal, provision of facilities and of information and promotion, but that they also cooperate and coordinate with and into the wider community as required. Up to a point, Berkeley, Oakland, San Leandro and Richmond, or Pasadena, Long Beach, Pomona, Santa Barbara, etc., can go it alone, and should do so. Our democracy rests firmly on grass roots, local individual community development, planning and programming. But the tremendous problems of physical design, and of providing basic facilities essential to economic progress and civilized living in metropolitan areas cannot be resolved in this manner alone. Their resolution must depend upon a broader, coordinated democratic effort. In such broad and coordinated efforts, *local* objectives, plans and promotion must be periodically adjusted and related to the broader *general* developments, trends, and needs. The San Francisco Bay Area Council well illustrates the needs and difficulties in such endeavors.

Inevitably in an advancing, complex industrial society, it becomes necessary to guarantee the provision of conditions, facilities, and services for economic development that transcend the capabilities of local communities or of

single business enterprises. This should be done voluntarily, if possible; but it may often be necessary to make these provisions under public regulation.

Fortunately, there are very few "company towns" in this country. Unfortunately, however, too many local developmental agencies try to go it entirely alone. No community can offer industrial sites or opportunities for all types of industry. And the competitive opportunity offered on local sites will often be determined as much or more by what happens in contiguous or even remote areas as by local efforts, especially in an evolving metropolitan complex. Economic and industrial demands point clearly and positively towards inter-community and inter-regional cooperation and coordination in planning the basic services and facilities that cannot be provided by separate small local political divisions. And they make the hopelessly jumbled barriers sometimes erected by competing minor local political divisions totally unrealistic.

Means must and will be found to provide the know-how and facilities beyond the reach of local communities. The state government has been forced to intervene aggressively in providing some facilities, such as water, highways and waste disposal. A systematic program of state intervention and coordination was inevitable in such situations. But ideally, the state should intervene only when local political divisions and resources are inadequate to the needs; for not only is economic balance important, but also a satisfactory balance among local, regional, and state agencies.

A STATE INDUSTRIAL DEVELOPMENT AGENCY

The issue of balance between local and state agencies and programs is of particular interest in California. Recently there has been much discussion of a state-wide governmental agency for industrial development. Proposals for such a state agency have been discussed from time

to time over the years, and recently these discussions have taken a more insistent tone.¹

The observation that California stands almost alone among the states in the absence of such a central agency carries little weight in many quarters in light of the state's population growth and industrial expansion. We have become a modern, complex, highly urbanized, industrial society without the benefit of a special central state-wide governmental agency dedicated to this basic task, except, perhaps, for brief intervals (e.g., the temporary state Re-employment and Reconstruction Commission at the end of World War II).

But much of the responsibility characteristic of a central state developmental agency has been carried privately by the California State Chamber of Commerce, regional and local chambers of commerce and numerous other private enterprises, including banks, railways, public utilities, and realty firms. Moreover, the state government has by no means shirked its broad basic obligations; it has carried these through various agencies under the coordination of the Governor and the Legislature.

The problem in California, therefore, is not that the state or private groups have failed to provide any state-wide facilities and coordination. The problem is rather that the techniques of the past may not be adequate for future needs. A central state-wide agency for industrial development could make a significant contribution to the balanced economic development of the state as a whole and of its individual communities.

The general role of such an agency in California should not be merely a promotional and advertising agency, in the pattern of some states. The need in California is for a body of experts, with adequate staff assistance and with access to the best available advice and opinion, to analyze on a continuing basis the

broad over-all pattern of economic and industrial needs of the state in the years ahead.

A central state agency in this field should not have operating or administrative duties, except as other agencies cannot carry the responsibilities adequately or at all. Rather, it should advise, stimulate, and facilitate.

It would not, however, be able to contribute notably in these capacities unless (1) it were led by persons whose advice was sought because it was reasonable and sound, and (2) the head or heads of the agency were given top-level governmental status. The saddest spectacle in bureaucracy is an advisory agency whose advice is neither taken nor sought. The only thing sadder is a coordinating agency without power or opportunity to coordinate.²

The specific responsibilities and duties of a central state developmental agency may be classified under five headings:

1. *Informational, educational, and research:*

The agency should be the center of accurate, adequate objective data about the state as a whole and all of its political subdivisions and important regional groupings of local political units. In carrying out this responsibility, the agency should rely upon the numerous existing private and governmental sources of data. Its primary role should be to act as a collection center for data³ or as a center of knowledge of sources of data and of research results. It should not undertake primary collecting itself

² The writer speaks with feeling derived from experience in Washington, D.C., in 1948-49 with the late National Security Resources Board, as one of four directors of this agency. The primary responsibility of the agency was to advise on and coordinate all aspects of mobilization planning. For a brief period, it appeared that this approach might be effective, but chiefly because of the high interest expressed by the President of the United States under conditions of emergency. Once the emergency and Presidential interest passed, most personnel returned to their private pursuits or transferred to other agencies. The official demise was preceded by the unofficial one represented by loss of key personnel and lowered morale.

³ An excellent example is the new *California Statistical Abstract* prepared by the California State Inter-departments Research Coordinating Committee, sponsored by the California Senate Fact-Finding Committee on Commerce and Economic Development.

¹ See especially the *Final Report of the Senate Fact-Finding Committee in Commerce and Economic Development*, published by the Senate of the State of California, 1957.

if it is possible to obtain adequate, reliable data by other means. It should help the existing collection and fact-finding agencies to maintain and improve their facilities and results. It should be a center to which anyone might go for thoroughly unbiased assistance in establishing the facts about any community or area. The state agency, above all, must guarantee the integrity and objectivity of the basic data.

But often the collection and presentation of basic data are not enough. Hence, the agency also must be a source of information about studies and researches in this broad field. It would perform an enormously valuable service if it could provide ready access to (or advice as to the availability of) published or other studies. In this capacity, also, the agency would rely primarily upon the activities of existing agencies, federal, state, private, etc.,—including, of course, the universities, colleges, and libraries. In some instances, it would take the initiative in suggesting important research studies to established research or other agencies. Although it might have funds and staff to initiate and complete some research on its own when no other way is feasible, it would typically use its own funds to subsidize research under the aegis of other private, educational, or governmental enterprises rather than through its own staff.

Along with these services, the agency could make an important contribution by educating local communities as to the requirements for effective industrial development. It could sponsor conferences, seminars and perhaps even systematic courses of study and published materials. Local educational institutions could be ready-made vehicles to assist in such work. For the most part, the role of the central agency should be to stimulate, advise and promote educational programs. It might, however, find it advisable in some instances to develop some study materials or conference plans and leadership. There is an excellent backlog of both

experience and materials in California and elsewhere for such conferences.

2. *Liaison*: In carrying out its informational, research, educational and facilitating responsibilities, the agency must maintain systematic liaison relationships on a wide front. The potential number of contacts is so enormous as to require high selectivity in formal relations together with a very wide array of informal, more casual contacts. The list of formal liaison relations cannot be made up completely beforehand, but at least it must include the various state departments, some federal departments and units (as the Department of Commerce), some strategic private agencies (as the State Chamber of Commerce and Stanford Research Institute), other state developmental agencies, etc. Much of this liaison can be maintained through published materials and by correspondence. Some of it, however, will require personal relations, organized committee work, and attendance at meetings.

3. *Advisory*: If the agency has a high level staff with a broad, sound background, and strategic liaison relationships, then it should become a center of advice for the Governor, state department heads, legislators, local communities, and private industry, and a number of others as well. Possibly, certain formal reports should be published regularly, but only when they are truly important and the information is not otherwise available. The preparation of regular outlook reports or of annual summaries can be horribly tedious for research personnel and enormously expensive.

What is needed above all is an alert, intelligent informed head and staff who will become a center of advice and counsel because of the high quality of advice they give, either directly or indirectly by referral elsewhere to sound authority. The most important advisory service would arise from broad competence concerning the state's over-all emerging pattern of needs in the years ahead. Its interest should not

be merely local or immediate, but also general and long-run. It could make a tremendous contribution by weighing the short-run programs and opportunities in the scales of future needs and requirements.

Possibly, a combination of internal staff and formal outside advisory committee activities would be the most effective way of building high-level competence and recognition.

Two types of informal committee organization might be effective: namely, (1) from entirely within the existing able personnel of state agencies, and (2) an outside representative group or perhaps several such groups. In any event, the highest possible intelligence and know-how must be brought to bear upon the state's over-all pattern of economic and industrial development in the perspective of fiscal and tax policies, the economic and business climate, and the immediate and long-run economic outlook and needs of the state.

One of the most important advisory services would be rendered to decentralized local developmental programs throughout the state. The central staff should be able to assist a local group to appraise the local potentialities and to advise as to reasonable developmental procedures. Above all, it should be able to provide reasonable criteria and judgments concerning the effectiveness of local efforts, in relation to those of other areas and the state as a *whole*. In this process, too, it should be able to advise effectively against the unwise use of a community's resources in wasteful, artificial promotion.

4. Stimulative, promotional and catalytic: The central agency could have a significant impact by stimulating activities of private industry and of established governmental agencies in local communities. But such stimulation must be highly selective; it should proceed from a thorough background of knowledge, and be tailored to need. Otherwise, these efforts will peter out into willy-nilly efforts of a high-nuisance character.

While producing the greatest benefits, the catalytic responsibilities could raise the most difficult issues. Ideally, the benefits of the agency should be through its advisory, stimulative and promotional efforts. With the strong active interest of the Governor and of the Legislature and the active intervention of budgetary and finance officials, it should be possible to get excellent results through the existing state departments. The strength thus engendered would be most helpful in approaches to other governmental units, local planning and developmental agencies, and private industry. Possibly, specific responsibilities would have to be spelled out, especially in relation to local planning agencies.

5. Operating and supervisory: The agency should have little or no direct operating or administrative responsibilities, except perhaps by default. Three types of situations, however, may strain its advisory and facilitating functions to the limit. First, there is the problem of distressed areas within which the will or capabilities do not exist for a reasonable approach to a solution. Second, there are the difficult and delicate problems created by local programs with a penchant for artificial subsidy. And third, and most difficult, there are those situations in which the base for a sound, broad area program is destroyed by the presence of numerous small local-political units in wasteful rivalry rather than in helpful cooperation. It is preferable, to begin with, that the central agency should not have specific operating responsibilities in these situations. Instead, experience of a few years on an advisory and facilitating basis might provide the basis for a reasonable approach, whether through the grant of authority directly or in other ways.

FINAL OBSERVATION

A central state-wide industrial development agency could make an important contribution to California's future economic and industrial development and standard of living. The tre-

mendously complex problems and needs in the years ahead will require more effective coordination of knowledge, intelligence, and planning than in the past. A central agency should be primarily a catalytic agent for existing local, area, and state-wide governmental and private organizations and activities, and a center of sound, objective data, advice, and counsel. Promoting California throughout the United States and the world should not be its major responsibility.

To begin with, the central agency should have little or no direct operating or supervisory responsibility. Experience, however, may make

it desirable eventually to grant some such responsibilities either because of default elsewhere or because of the unique competence of the state-wide agency for the more difficult problems of coordination between local planning units and the state as a whole. Under effective leadership and with adequate support such an agency might well exert a strong unifying influence throughout the state by (1) pointing out important problems not now being handled, (2) reviewing and assisting local programs in balanced state-wide perspective, and (3) rendering important advisory, stimulative and catalytical services.

In the next three or four years Americans will have a chance to decide how decent a place this country will be to live in, and for generations to come. Already huge patches of once green countryside have been turned into vast, smog-filled deserts that are neither city, suburb, nor country, and each day—at a rate of some 3,000 acres a day—more countryside is being bulldozed under. You can't stop progress, they say, yet much more of this kind of progress and we shall have the paradox of prosperity lowering our real standard of living.

William H. Whyte, Jr.,
The Exploding Metropolis

RICHARD P. BARTHOL
MICHAEL J. GOLDSTEIN

Psychology and the Invisible Sell

Both advertisers and the public-at-large may be surprised by this analysis of what the "hidden sell" can—and cannot do.

The spark that fired the public was the announcement that a mysterious new technique had been used to induce unsuspecting moviegoers in New Jersey to eat popcorn and drink Coca-Cola. It was reported that the technique (repeatedly flashing popcorn and Coca-Cola ads on the screen so quickly that the audience was unaware of them) made use of something called "subliminal perception"—a cumbersome scientific phrase with ominous overtones which, possibly because it was never very clearly defined, was quick to catch the public imagination. Here, it appeared, was a method by which our minds could be influenced without the control of our conscious critical faculties. The possibilities of such a technique seemed unlimited.

Already uneasy about motivation research, the hidden sell, and the invisible sell, a substantial segment of the population responded with alarm to the possibility that thought control might not await 1984. "Subliminal perception" became a topic of concerned conversation at cocktail parties and editorial conferences throughout the nation. Official agencies of the United States government held

hearings. Television stations took positions for or against the use of subliminal advertising. At least two motion picture studios moved in to take advantage of the interest.

All of this excitement was refreshing to most psychologists, who had been following the gentle academic controversy about subliminal perception that has been simmering for over fifty years. We were pleasantly surprised that people outside our cloistered world, who had been no more interested in subliminal perception than in "retroactive inhibition" or the "kinesthetic figural aftereffect," were now writing articles or buttonholing friends to register opinions about one of psychology's least known areas. We were, however, somewhat dismayed to hear subliminal perception equated with mass hypnotism, brain-washing, and the loss of free will. Although we are deeply concerned about any potential abridgment of our personal freedoms, we do not feel threatened by the possible commercial application of subliminal stimulation. In fact, we share a common professional skepticism about the effectiveness of *genuinely* subliminal stimulation. In light of the public anxiety about sub-

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liminal perception, we feel that it may be helpful to separate the evidence concerning the known effects of subliminal stimulation from the fantasies which some of the published reports have elicited.

Much of the anxiety surrounding the term "subliminal" arises from the association of "subliminal" with "invisible," which carries magical connotations. "Subliminal" therefore seems to imply that something which is not seen can cause an idea or emotion. Actually, the term "subliminal" (below threshold) has acquired a number of meanings, the least accurate of which is "invisible." Psychologists traditionally use the term to refer to stimuli which are not clearly recognized by most people at a particular time. This does not mean that the stimuli are invisible; it means only that their exact nature is not clear.

For example, we might flash a word on a screen so briefly that, although an observer might be aware of the flash, or even that a word had been presented, he might not be able to recognize the word. That word would be subliminal—it would be below the observer's threshold for conscious recognition. The flash might be so brief that it would be below the recognition threshold for all of the people all of the time; it might be above the threshold for some of the people part of the time; it might be above the threshold for all of the people part of the time. In each of these instances, the stimulus is called "subliminal."

"Subliminal" indicates only that stimuli are below the threshold of conscious recognition; it does not indicate how far below. We should equate "subliminal" with "invisible" only when a stimulus is *never* recognized. (A stimulus that is clearly recognized is called "supraliminal," or above the threshold.)

When modifying the word "stimulation," subliminal refers to a stimulus which is presented, but to which an observer responds only part of the time (by convention, less than 50% of the time) because it is, for example, too

brief, too dim, or too low in volume to be consciously recognized. The frequency of response can vary considerably, depending both on the particular stimulus and the particular person. Thus a wide variety of stimuli that are not invisible are nonetheless subliminal. (Some of the current commercial attempts to utilize this type of stimulation should more properly be classified as using invisible rather than subliminal messages.)

Now we have come to a complicating factor. So far, we have said that a stimulus is subliminal when it is not strong or long enough to cause a response. There are many instances, however, when perfectly clear stimuli are responded to *as if* they were subliminal. The world may be "full of a number of things"—but we can respond only to some of these things at any one time, because of our "attention threshold." From the multiplicity of available stimuli, we tend to give our attention to those that coincide with our particular interest of the moment and to ignore the rest. Frequently stimuli which do not relate to our particular interests do not even reach our conscious awareness: these too may be classified as subliminal even though they themselves may be continuously clear. Here, then, are stimuli of sufficient intensity to be above our thresholds of recognition but which do not cause a response that indicates awareness.

Our not being consciously aware of a stimulus, however, does not mean that it cannot affect us. In fact, many of our current theories of psychotherapy imply that people react to cues of which they are not aware. The task of the psychotherapist frequently is to aid the patient to recognize these cues. The behavior of an individual may give clear evidence that he is responding to these stimuli even though he cannot state what is occurring.

This second kind of subliminal stimulation is exemplified by the manipulation of lighting, background music, scenery, and other such "marginal" stimuli in the theatre which de-

termine how we see the central stimulus, the play or motion picture. The average theatergoer is usually unaware of these peripheral factors, yet they may have a profound effect upon his reaction to the stage presentation. Advertisers make use of that kind of response by manipulating words, colors, and over-all design to heighten the effect of their advertising. This use of the subliminal has reached the height of sophistication in motivational advertising, where the peripheral features of the ad are designed to provide a new symbolic meaning for the product. Pierre Martineau, in his book, *Motivation in Advertising*¹ expresses this point well:

Successful persuasion through advertising consists of far more than doing clever tricks with words. The consumer has developed a protective husk against mere word claims . . . The visual symbols are not just a support for word claims. They can contribute meanings and association entirely apart and of much greater significance.

Actually, we have been exposed to subliminal stimulation of the second type for many years and there is little doubt that advertisers and propagandists will continue to develop new and better techniques designed to by-pass our normally available defenses against external influence. However, we wonder whether the much publicized techniques which make use of stimuli that are *in themselves* below the recognition threshold can qualify for equal standing with the present resources of the advertiser and the movie director.

WHAT RESEARCH SHOWS

A brief summary of psychological research on this problem might aid in clarifying the scientific status of the newer subliminal techniques. In the early part of this century, psychologists published reports² of the effects of subliminal stimulation on optical illusions. Other studies followed, but no major interest

was excited until psychoanalysis turned our attention to the importance of unconscious processes in perception.

Perhaps the clearest study on the problem was done by J. G. Miller³ in 1939-1940. He demonstrated that people could accurately identify geometrical forms presented below the level of awareness. The study is particularly impressive because the subjects thought they were participating in an extra-sensory perception experiment and did not know that any stimuli were being shown.

In a second study, Miller⁴ found that, under strong motivational conditions (money and fear of shock), his subjects improved in their ability to identify subliminal stimuli correctly. The pattern was such that we would have called it learning, had the stimuli been supraliminal. One of the important findings was that the closer the stimuli were to threshold, the better was the discrimination. The practical importance of this to the advertiser is clear when we note that one of the commercial firms purports to project messages at a level considerably below the level of awareness. Excluding the possibility that these messages are invisible, Miller's work indicates that, at best, they would be at the point where the poorest discrimination is taking place.

In 1949, Richard Lazarus and Robert McCleary, then of Johns Hopkins University, published a study⁵ that supported and extended Miller's conclusions. They showed that measures of autonomic nervous system activity indicated selective responsiveness to subliminal material. They presented words clearly above threshold and simultaneously shocked the subjects electrically when certain of the words appeared. Later, when the words were presented subliminally, without shock, responses to the

³ J. G. Miller, "Discrimination Without Awareness," *American Journal of Psychology*, LII (1939), 574-577.

⁴ J. G. Miller, "The Role of Motivation in Learning Without Awareness," *American Journal of Psychology*, LIII (1940), 229-239.

⁵ R. McCleary and R. Lazarus, "Autonomic Discrimination Without Awareness," *Journal of Personality*, XVIII (1949), 172-179.

¹ P. Martineau, *Motivation in Advertising* (New York: McGraw-Hill Book Co., 1957).

² K. Dunlap, "Effect of Imperceptible Shadows on the Judgments of Distance," *Psychological Review*, VII (1900), 435-453.

words which had previously been accompanied by shock differed from the responses to non-shock words, as measured by a Galvanometer (an instrument which detects small changes in the electrical resistance of the skin).

Other studies⁶ qualify the findings of Miller, and McCleary and Lazarus. The ingenious experiments of Postman and Bruner,⁷ starting in 1948, demonstrated that there are wide individual differences in threshold for subliminal stimuli. What is ambiguous for one person can be clearly visible for another. These thresholds are readily influenced by the nature of the material (anxiety-arousing or pleasurable) and the momentary motivational state of the individual.

From these studies, we can conclude that an effective subliminal message must be close to the threshold. It necessarily follows that a subliminal message that will have impact on a substantial portion of some large group will be clearly visible to a portion of that group, because of individual differences in threshold. For that portion for whom it is not clearly visible, there is a strong possibility that the message will be distorted in terms of the particular needs and anxieties of the individual members of the audience.

The implication of these conclusions is that it will be impossible to influence, in the intended way, all of a large audience at a level below conscious awareness.

Other evidence suggests that knowing what is being projected usually makes recognition much easier. In addition, people who have experimented with subliminal stimulation have

frequently noted that practice improves the skill in discrimination. If the published suggestion of the Subliminal Projection Corporation be followed and audiences be informed of the content of the projected material, then the proportion of the audience for whom the message is visible will be sharply increased. Granting that a message might be visible for a large percentage of an audience, would such a message lose all effectiveness? No one to date has compared the relative effectiveness of subliminal and supraliminal materials. Possibly flashing "Coca-Cola" at a clearly visible level during a movie might be more effective than its subliminal counterpart.

Although the studies we have quoted indicate that people can respond selectively to subliminal stimuli, it is obvious that there are many technical problems in keeping the stimuli subliminal for any large group. But let us assume that these technical problems could be solved, that some method might be devised for stimulating subliminally all of the people all of the time. We are still left with the question of the potency of this form of stimulation. It is one thing to show that people can discriminate subliminal stimuli. It is quite another to show that this sort of discrimination can have any real influence upon action or attitudes.

The most widely quoted study pertinent to this question was done by the psychologist George Klein⁸ and his associates at New York University. Klein showed that people who were subliminally exposed to the words "happy" and "angry" differed in their judgment of a neutral face presented supraliminally. People exposed to "angry" judged the face to be angry; those exposed to "happy" judged the face to be happy. Although this is important evidence, there is a fallacy in viewing it as supporting the claims for subliminal advertising. Note that the face was carefully selected so that no clues

⁶ For a comprehensive survey, see J. V. McConnell, et al., "Subliminal Stimulation: An Overview," *American Psychologist*, XII (1958), 229-242.

⁷ J. E. Bruner and L. Postman, "Emotional Selectivity in Perception and Action," *Journal of Personality*, XVI (1947), 69-77; and "Symbolic Value as an Organizing Factor in Perception," *Journal of Social Psychology*, XXVII (1948), 27, 203-208; and L. Postman, "The Experimental Analysis of Motivational Factors in Perception," *Current Theory and Research in Motivation: A Symposium* (Lincoln: University of Nebraska Press, 1953).

⁸ G. S. Klein, "Cognition Without Awareness: Subliminal and Supraliminal Influences Upon Conscious Thought," *Journal of Abnormal and Social Psychology* (In Press).

were given about the expressed emotion, leaving ample room for freedom of judgment. This situation is not usually typical of product names, which have strongly established associations, both positive and negative.

Another report which has been offered as the strongest evidence for the potency of subliminal stimulation is the one which initiated the current public interest.⁹ The available information seems to be as follows. During a six-week period, 45,699 people attending a motion picture theater in New Jersey were exposed to one of two subliminal messages: "Hungry? Eat Popcorn" or "Drink Coca-Cola." Sales figures during the test period were compared with previous sales records. Most reports state that popcorn sales increased 58% and Coca-Cola sales increased 18%, although other reports reverse the numbers. Either way the figures sound impressive.

There are, however, a number of questions which disturb us. The most important one is central to scientific investigation: what is the meaning of comparing these records with previous sales records? A rigorous study would have compared the experimental figures with those obtained from other theatres showing the same movie, but with no subliminal advertising; or the subliminal message would have been presented on alternate days so that we might have had a direct comparison in the same theatre, for the same period of time, with the same movie.

It would have been interesting also to have used another control theatre which presented the same amount of advertising, only supra-liminally. Although it might be unfair to criticize a study whose details are not publicly available, the absence of a control group violates one of the most basic canons of experimental science.

We are also curious about the effect of the particular movie shown, which apparently was

"Picnic." Coca-Cola and popcorn sales would be likely to increase during the showing of this film, which depicted people eating and drinking just such products. As we remember the film, much emphasis was placed upon the weather, which was hot. This leads to other related questions: What was the outside temperature? Was the theatre air-conditioned? Were sales of Coca-Cola made when people came in from the hot sidewalks? Why was there such a large difference in the effectiveness of the Coca-Cola message as compared with the popcorn message?

In the absence of an adequate scientific report, we feel that the stated effectiveness of subliminal stimulation for advertising purposes remains unsubstantiated.

Announcements have been made of two motion pictures which plan to use subliminal techniques to enhance the dramatic impact of the films. Theoretically, this area holds some promise, since conditions are optimal for reception of the subliminal message. This type of stimulation can be used in two ways, to prepare the viewer for an imminent scene and to supplement the reaction to a scene actually on the screen. Used in either way, it may be possible to strengthen the emotional value of the story.

Subliminal material, however, cannot help a poor film. If the producer wants to make a successful film, he must make a good one. If he presents a sloppy product, the subliminal material will be ineffective or will work against him.

There is one exception—the first film using subliminal stimulation might succeed simply by attracting customers out of curiosity. If the film is not good entertainment, the project will fail, which might inhibit the growth of what could be an important adjunct to entertainment. We cannot feel much concern about the ethics of subliminal stimulation when used for entertainment since we feel that it is not substantially different from the use of background music or ingenious lighting.

⁹ H. Brean, "What Hidden Sell Is All About," *Life*, March 31, 1958, pp. 104-114.

We are currently attempting to evaluate the effects of subliminal stimulation in situations that are analogous to the presentation of a motion picture film. We believe that there is still much to be learned and we find it somewhat disturbing that such careful experimentation is not being conducted by the commercial groups interested in using the techniques on the general public. For example, the recent article in *Life* described the technique for subliminal stimulation to be used in a film. An image will be presented for 1/50th of a second, which, it was stated, is too short a period for the image to register on the conscious mind. That is nonsense. A very simple experiment will demonstrate that 1/50th of a second is ample time for registration. Any camera with a standard shutter will do. Open the shutter by placing the exposure adjustment on "time." Open the back so that you can look through the lens, adjusting your distance from the lens so that you get a clear image, which will be upside down. Set the time on 1/50th or even 1/100th of a second and snap the shutter. You will have no trouble reading a word, even upside down, at that speed.

There are ways of overcoming the speed problem. If the stimulus object is not bright enough, or if there is not enough contrast with the background material, or if it is buried in other material, a brief exposure is sometimes not sufficient to reveal the details. If you look at a dimly lighted object through your camera at 1/50th of a second, you may not be able to see it clearly. But you will know that *something* was there. A hastily made film or advertising campaign is likely to err by presenting messages which are either supraliminal or, more likely, invisible rather than just below threshold for most people.

CAN IT SELL?

The evidence seems clear that under certain conditions material presented subliminally can have some effect upon the viewer. Now we can

turn to the problem of ethics and related problems of advertising, "brain-washing," and thought control. We feel strongly that there is small danger from subliminal stimulation. At best, the process is weak. There is a wealth of evidence which indicates that people perceive supraliminal stimuli in terms of their own needs, values and expectations. There is even stronger evidence that this tendency would be even more marked with ambiguous materials, such as subliminal messages. The further below threshold the message is presented, the greater the capacity for distortion, if, indeed, any message gets through. Consider the message "Drink Coca-Cola." Exposed subliminally, this might be read, "Drink Pepsi Cola," "Drink Cocoa," or even "Drive Slowly."

The problem of accurate communication is further confounded when we consider the necessity for presenting the subliminal message together with other, supraliminal material, usually entertainment. Evidence provided by the PreCon Corporation, a commercial organization marketing subliminal techniques, indicates that the feeling about the supraliminal material will affect the manner in which the subliminal message is received. Surprisingly, the greatest negative feeling seems to arise when the supraliminal material is viewed with indifference.

Is there a danger from political manipulation? Our nervous system affords us almost complete protection. Again you can act as your own experimenter. Open a book at random. Close your eyes, then open and close them. How many words did you see? If you were not too hasty, you probably saw three words. Here is an important limitation on any kind of subliminal stimulation. One cannot present a philosophy or any kind of subtle propaganda in three words. We can say "Burn City Hall" or "Vote for Smith," but we cannot say "The American way is the best way to have a happy life." And remember that the first two messages might be seen as "Buy City Hall," "Bury Dirty

Hail," "Hate Joe Smith," or "Eat More Fish."

It is our contention that the mass media can cause us little damage with subliminal stimulation. One can envision other situations where small groups or a single individual could be exposed to subliminal stimuli and questions might be raised about potential danger. Factories, offices, prisons, or one's own home might be used. Even here the effectiveness is quite limited. Everyone knows "Drive Safely," but our accidents continue. The sign "The XYZ Company is a good place to work" does not deter the workers from going out on strike. Some roudé might flash a sign "Kiss Joe" subliminally to a prospective seductee, but candle light, soft music, and liquor are more effective. At least with the latter more traditional accoutrements, the message will not be misinterpreted. Who knows but that "Kiss Joe" might cause the girl to kick Joe, or even rush out to kiss Moe?

The same limitations apply to subliminal advertising as to any other kind of advertising. There is competition. Not even the subconscious can simultaneously drink Coca-Cola, Pepsi Cola, and hot buttered rum. If additional protection is needed, consider the suggestion

of some wag that above each television set we install a sign that flashes a small subliminal "Don't."

If you are still concerned about the application of subliminal stimulation, here are our rules of thumb for evaluating the technique. If you are an advertiser and are shown a device that presents material that no one can see, watch out: it is probably simply invisible. If some people see it, it might be effective. Be careful that your message is presented only with material that everyone likes, otherwise it might work against you. And don't be disappointed if your competitor gets more sales than you do: the public might not have gotten the message straight. If you are just part of the public, like the writers, and are merely trying to protect yourself from that vast horde that is trying to sell you something or get you to do something, don't worry about subliminal stimulation. They can't touch us—in any important way. We are staunchly protected by our inefficient nervous systems, our prejudices, our lack of attention, and the inalienable right to completely misunderstand, misinterpret, and ignore what we don't see clearly.

Although this may seem a paradox, all exact science is dominated by the idea of approximation. When a man tells you that he knows the exact truth about anything, you are safe in inferring that he is an inexact man.

Bertrand Russell

FRED MASSARIK
IRVING R. WESCHLER

Empathy Revisited¹

....the Process of Understanding People.

Mike Corey walked into his office, fifteen minutes behind schedule. Through the glass partition Mike caught a glimpse of his boss. Arthur Blick looked up briefly as Mike slid into his chair. A number of signs obscured the full view: "Tomorrow We Finally Have to Get Organized," "THINK," "Wait Till Next Time—You Have Done Enough Damage for Now." Mike tried to look inconspicuous, though his mind was working rapidly. He was late for the third straight day. Oh, there were good reasons all right...one day his wife needed to be driven downtown and *she* wasn't ready—one day he had a terrible headache...and then...today.... His thoughts shifted abruptly—it really didn't matter as long as Blick was in a good mood.... Mike had some

very definite ideas about what kind of guy his boss was. Usually he wasn't a bad sort; business-like, but human too. If you had a big problem, he probably would listen. Still he was so darn changeable, and you had to hit him "just right" if you wanted to get along. This morning Blick seemed preoccupied... he looked up as if he hardly saw you, yet the way he spun back to his desk telegraphed "bad news."

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This was Jean Krugmeier's first day on her job. She liked being an employment interviewer. People were interesting, and it would be a novel experience to sit behind a desk all day. The initial two interviews proceeded uneventfully. The third applicant wanted to be foreman of the shipping gang. He was a young, burly 250 pounder who said that he used to work in the steel mills near Gary. He spoke loudly, with much self-assurance. "Some sort of a bully—a leering Casanova of the hot-rod set," Jean thought. Jean always did dislike guys like this, especially this sort of massive redhead. Just like her kid brother used to be—"a real pest!" The more he bragged about his qualifications, the more Jean became annoyed. It wouldn't do to let her feelings show; interviewers are supposed to be friendly and objec-

¹ The area covered by this article has been subject to systematic study only in very recent years. It is still much in flux, and few findings of certainty are as yet available. As we seek to lay out some of the problems, methods and results with which this research is concerned, we are much aware of the tentative nature of our comments. The technically-inclined reader is urged to examine R. Tagiuri and L. Petrullo, *Person Perception and Interpersonal Behavior* (Stanford: Stanford University Press, 1958); F. Heider, *Psychology of Interpersonal Relations* (New York: John Wiley and Sons, 1958); and U. Bronfenbrenner, J. Harding and M. Galloway, "The Measurement of Skill in Social Perception" in D. C. McClelland, *et al.*, *Talent and Society* (Princeton: Van Nostrand Co., 1958).

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tive. She smiled sweetly, even if she did have a mild suspicion that her antagonism might be coming through. "I am sorry, we cannot use you just now," she said. "You don't seem to have the kind of experience we are looking for. But we'll be sure to keep your application in the active file and call you as soon as something comes us. Thank you for thinking of applying with us."

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LOOKING AT SOCIAL PERCEPTION

These anecdotes serve to illustrate the all-pervasive role that *social perception* plays in our lives. Forming impressions of people is a part of our daily experience, yet we rarely single out the process for explicit consideration.

Mike Corey was very much concerned with making the correct perceptual assessment of Arthur Blick's mood for the morning. Of course, he reacted without specifically worrying about his *empathy*.² He did what came naturally. The physical obstructions in the glass partition between the two offices were not the only barriers between these men. Mike's own views, attitudes, and feelings contributed to the difficulties, and so in turn did Blick's behavior, which provided Mike with only a limited amount of information (or *cues*). The fact that the entire relationship was set in the context of a given office situation both aided and impeded the extent to which Mike Corey could accurately perceive the relevant aspects of his boss's personality.

Jean Krugmeier probably does not think of herself as a prejudiced person. She may associate the term "prejudice" primarily with racial intolerance. She argues vociferously that people must have an "open mind." Still, like all of us, she too has "blind spots" and uses "shortcut thinking" which gives her a distorted picture of reality. Her feelings about burly red-

headed men are very much like any other prejudice. They are supported by a *stereotype* that, in essence, says: "All of them are alike!" Thus, Jean's feelings may be irrational, her mind may be closed, and her social perception less than accurate because she subconsciously prevents relevant information about people "of this sort" from reaching her.

The Illusion of Objectivity

Most of us pride ourselves on our ability to look at people in a dispassionate, objective manner. Yet the psychological realities are that every time we have a personal contact we *do* form favorable or unfavorable impressions that influence our social behavior. We all have some positive or negative feeling in our interpersonal experiences. We *do* like or dislike in varying degrees, even if we are not always willing or able to recognize our true feelings.

Social perception is the means by which people form impressions of and, hopefully, understand one another. *Empathy*, or *social sensitivity*, is the extent to which they succeed in developing *accurate impressions*, or actual understanding, of others.³ Social perception is not always rational or conscious; thus it follows that empathy is not necessarily the result of conscious, rational effort. For some, it may just seem to "happen," while others may develop it only after much training and living experience.

Three basic aspects of social perception must be considered: (1) *the perceiver*, the person who is "looking" and attempting to understand; (2) *the perceived*, the person who is being "looked at" or understood; and (3)

³ Many complexities are involved in the actual measurement of social sensitivity. The definition given here is a kind of practical shortcut, useful for most everyday applications. For a consideration of the conceptual issues, see, for example, N. L. Gage and L. J. Cronbach, "Conceptual and Methodological Problems in Interpersonal Perception," *Psychological Review*, LXII (1955), 411-422; and L. J. Cronbach, "Processes Affecting Scores on 'Understanding of Others' and 'Assumed Similarity,'" *Psychological Bulletin*, LII (1955), 177-193.

² In this context, we shall treat as synonymous the concepts *empathy*, *understanding of people*, *social sensitivity*, and *accuracy in social perception*.

the situation, the total setting of social and nonsocial forces within which the act of social perception is lodged.⁴ We have already encountered "perceivers" Mike Corey and Jean Krugmeier, and their respective "perceived" counterparts, Arthur Blick and the burly job applicant.

The Perceivers and the Perceived

Perceivers and perceived need not be single individuals. Entire *social groupings* may do the "looking" or may be "looked at." We can, for example, conceive of the social perceptions existing between two rival departments of a corporation, with each department viewing the other with possible hostility or competitive jealousy. Similarly, we may distinguish social perceptions among small work groups, among large companies, and even among nations. Indeed any group of people, as well as any given person, can be a principal participant in the process of social perception.

The perceiver and perceived are not billiard balls on a flat table top. Their interactions do not usually produce obvious one-to-one cause-and-effect relations, for the perceived and the perceiver both possess personalities of great complexity. Social perception develops in the give-and-take among these *personalities-in-action*.

What is termed "personality" for the individual may be viewed as a unique pattern of "group characteristics" for the social grouping, be it work group, department, company, or nation. This pattern does not result from a simple addition of the personalities of individual members, although these individual personalities do have an impact. Rather, the social grouping's "personality" results from its formal and informal traditions, and from its accepted ways of "doing things." For example, some groups operate rigidly "according to the book;" others are more flexible and free-

wheeling. Some groups are highly integrated, with close and supportive relationships existing among their members; others are torn by antagonistic cliques and by intense rivalries. Some groups set high and constant standards for the admission of new members; others are more open and lax in their membership requirements.⁵

Patterns of Perceiving

The process of social perception can be graphically portrayed in a variety of ways. If *I* stands for "individual," and *G* for any grouping of individuals (and if the arrow stands for the act of perceiving), we may consider such relations as the following:

Perceiver to Perceived

Type-A $I \rightarrow I$ (Individual to Individual)

Type-B $I \rightarrow G$ (Individual to Grouping)

Type-C $G \rightarrow I$ (Grouping to Individual)

Type-D $G \rightarrow G$ (Grouping to Grouping)

Our anecdotes were of the Type-A variety—one individual perceiving another individual. Jean Krugmeier's perception of the job applicant, however, was influenced by a Type-B perception, her view of all burly, red-headed men—a view that she as an individual held for a broader (though tenuous) grouping of persons. Under conditions beyond those already described, Mike Corey may be perceived in a Type-C relationship by his fellow employees, a grouping that may view him with envy and anger because of his ability to get away with lateness without apparent untoward consequences.

Type-D perceptions become important particularly in attempts to analyze the nature of complex organizations, such as large sections

⁵ Among the better-known approaches to the analysis of a group's personality is that of J. K. Hemphill and C. M. Westie, "The Measurement of Group Dimensions," *Journal of Psychology*, XXIX (1950), 325-342. Many sociologists have also made important contributions in this area; see, for example, Robert Dubin, *The World of Work* (Englewood Cliffs, N.J.: Prentice-Hall, 1958); and Melville Dalton, *Men Who Manage* (New York: John Wiley and Sons, in press).

⁴ This approach is in harmony with Robert Tannenbaum and Fred Massarik, "Leadership: A Frame of Reference," *Management Science*, IV, 1 (October, 1957), 1-19.

or departments, entire firms, or other entities composed of various subgroups. For instance, a management consultant may wish to assess the way in which the Sales Department views the Credit Department—how the Research Section sees the Development Branch—or how Employee Relations relates to Wage and Salary Administration—and vice versa.

The four types of perceptual processes noted so far are relatively straightforward: Type-A, interindividual perception; Type-B, an individual's perception of a grouping; Type-C, a grouping's perception of an individual; and Type-D, intergroup perception. Yet in each type countless obvious as well as hidden distortions can and do occur which prevent the perceiver from obtaining a faithful image. These breakdowns in communications, which we shall need to explore further at a later point, magnify their effects when we consider what might be termed *higher-order perception*.

As Mike Corey, for instance, forms his perceptions of Arthur Blick, he also considers the way in which Blick reciprocates. In other words, Corey is very much concerned to know how Blick feels about him. Corey makes assumptions about Blick's view of him which may or may not be correct. He may "think" that Blick hardly saw him, when—if he were to probe Blick's true reaction—he might learn that Blick saw Corey very well indeed and was actively annoyed with his repeated tardiness. The extent to which one accurately recognizes someone else's reactions to oneself defines a special kind of social sensitivity—the ability to assess correctly what another person "thinks" about you.

Above, we are dealing with a "perception of a perception." We may conceive of a theoretically infinite series of social perceptions that begin as follows:

1. First-order perceptions: how the perceiver views the perceived (as illustrated by Types A, B, C, and D).
2. Second-order perceptions: how the per-

ceiver "thinks" the perceived views the perceiver.

3. Third-order perceptions: how the perceiver "thinks" the perceived views "the perceiver's perception of the perceived," etc.

By the time we reach third-order perceptions, the pattern has become immensely problematical. Any further higher order adds to the complexity. Fortunately, most of our actual perceptions governing interactions with others probably do not get more involved than those defined by the first or second order.

One Empathy—or Many?

There may be several different "empathies." Some perceivers seem more skillful in seeing beneath the surface and in ferreting out correct perceptions from vast networks of superficial psychological defenses. Others are more capable in hurdling the abyss that separates their actual observations of cues from the more remote recesses of behavior that they are seeking to understand. Some excel in painstakingly accumulating fragments of perceptual evidence and piecing them together. Others have a unique capacity for the elegant sweep that pulls together quickly and accurately a broad complexity of social phenomena.

Understanding social groupings rather than individuals involves unique problems and may require different skills of perception from those needed in understanding individuals. The talent for sizing up group opinion is probably different from the "diagnostic skills" needed for understanding a specific employee. An executive of a large corporation, for instance, may excel in accurately assessing opinions and attitudes of union and work force, but he may need to sharpen his skills in empathizing with his fellow corporate officers.

The probable existence of several "empathies" is not surprising if we consider the diversity of the factors at work. We have available a tremendous variety of cues that we may

draw on in order to understand how another person thinks or feels, and these make differential demands upon our skills to draw inferences that will yield accurate perceptions.

Cues: Raw Material of Perceiving

Cues are often direct: through words, gestures, facial expressions, and specific behavioral acts, they are transmitted to the perceiver (interpreter) directly by the perceived (communicator), sometimes consciously, sometimes subconsciously. At other times, the perceiver gets his insights second hand—as by gossip, through reference letters, or by comments overheard during a coffee-break.

Some cues are more obvious in their apparent meaning. A broad smile and a friendly hello usually reflect a clear expression of personal warmth, while a vague wave of the hand is considerably more ambiguous and thus more difficult to interpret.

Some cues are more clear-cut than others. A girl's approximate age—the beautician's art notwithstanding—is likely to be more easily assessable than the meaning of a Mona Lisa-like smile; and despite best intentions, it may be virtually impossible to base an analysis of a person's basic psychological motivations on a casual martini-clouded social contact.

The psychological leap to be made from the cues available to what we seek to understand presents another consideration. As Mike Corey viewed his boss Blick, he had knowledge of Blick's customary office behavior. He had observed Blick before and under roughly similar conditions. Past cues provided a good base of present generalizations. On the other hand, Mike Corey might want to join Blick's country-club set. There he would need some insights into the latter's social behavior. Corey would search for some implicit theory, derived from Blick's on-the-job reactions, the only reactions with which he is actually familiar. He would try to extrapolate from Blick's available pattern of cues into a relatively distant and differ-

ent situation, and risk empathic failure in the process.

The Perceiver's Background

The perceiver brings to the task of understanding others two sets of interrelated characteristics: (1) his general background, *demographic characteristics*; and (2) his unique self, *personality characteristics*.

Demographic characteristics are those broad sociological aspects of the individual which, for the most part, are easily definable, specific, and outside the more subtle ebb-and-flow of personality as such. Age, sex, nationality, religion, number of siblings, occupation, and economic level are illustrative.

When the psychologist Ronald Taft⁶ reviewed studies on the relation of certain demographic attributes to social perceptual skill (especially empathy for individuals rather than for social groupings), he formed conclusions such as the following: (a) ability to judge emotional expression in others increases with age in children, but does not seem to increase further with age in adulthood; (b) sex differences in empathy are negligible, but there may be a very slight edge in favor of women.

Thus it seems that when dealing with adults, such as those encountered in business, age alone provides no free ticket to social perceptual wisdom. Although—hopefully—age may bring increases in some areas of technical knowledge, the process of getting older in and of itself does not lead to heightened empathy. Further, there does not seem to be much substance to the widely held assumption that women are "better judges" of people than men; the controversy on this point is not fully resolved.

More significant relationships emerge from an analysis of dynamic *personality characteristics*. Taft's attempt to find common threads in the web of available research leads him to

⁶ See R. Taft, "The Ability to Judge People." *Psychological Bulletin*, LII (1955), 1-23.

postulate rather substantial association between emotional adjustment and empathy. A person's emotional adjustment hinges primarily on how he sees himself and how he feels about himself—it is closely linked to his *self-concept*.

One's self-concept provides a kind of psychological "base of operations" that inevitably affects relations with family, friends, business associates, and strangers. Some aspects of the self-concept are at the surface of personality; these are the *publicly held attitudes*—the things we don't mind telling other people about ourselves and our views of the world. And there are some feelings about the self of which we are aware, but which we do not want to share with others—these are the *privately held attitudes* to the self. And buried still deeper are the *subconscious and unconscious aspects*—feelings about "who" we are and "what" we are that somehow we cannot face up to, even to ourselves. The theories of psychoanalysis and depth psychology deal at length with these "disassociated" parts of the self, which as subtly disturbing, often powerful sources of internal turmoil may affect and hinder a person's effective functioning.

BARRIERS AND AIDS TO EMPATHY

The individual who has resolved most of his internal conflicts appears in a better position to direct his energies to the understanding of others. He is likely not to meet "booby traps" of his own unconscious devising that prevent accurate perception. The *healthy personality* is based upon a fundamental self-acceptance at all levels—public to unconscious. It relies on an openness to experience, a willingness to respond realistically to relevant cues; it exhibits a lack of dogmatism and a capacity for responding to the world flexibly and dynamically. When we are under pressure, or in a state of anxiety, we are less likely to perceive accurately the motives and actions of

those about us. It is only when we have reached a fair give-and-take balance between ourselves and the world that we are in a secure position to venture important human relations judgments.

In light of this, is it likely that in a Nirvana of perfect psychological equilibrium all social perceptions would be accurate? On the basis of what we know, the answer is no. In order to understand others, there must be some driving force, some motivation, some problem. Such cause or problem implies the existence of some tensions within the perceiver. In a fully tensionless state—in a hypothetical state of perfect adjustment—there could be no reason to care about understanding anything or anybody. As a result there would be little meaningful social perception or social interaction. As too many cooks are said to spoil the broth, too many tranquilizers seem to spoil the well-springs of human understanding. While excess tension reduces empathy, its complete absence induces a state of apathy.

The Special Case of Self-Insight

Empathy and self-insight tend to go hand in hand, although the evidence is by no means all in.⁷ Fortunate, they say, is the individual who knows how much or how little he truly knows about himself—who is aware of his own capacities, limitations, motivations, and attitudes.

The sole tool that we bring to the task of understanding others is our own personality. The cues we receive from the outside must be processed through the perceptual equipment that is "us"—through lenses of our own background and expectations. If we are to be successful in assessing the meaning of cues that impinge on us, we must become aware of the

⁷ See, for example, J. S. Bruner and R. Tagiuri, "The Perception of People" in G. Lindzey (editor), *Handbook of Social Psychology*, II (Cambridge, Mass.: Addison-Wesley Publishing Co., 1954), 645-646.

distortions that may be introduced by our "built-in" perceptual equipment.

A realistic view of our perceptual limitations, and of the kinds of aberrations we tend to introduce in what we see and hear, should help us to make allowances in interpreting the world around us. If, for instance, we are aware that people who seem to be weak and submissive make us irrationally angry, we may be able to develop safeguards against our own unreasonable anger and ultimately gain a more realistic understanding of the motivations of the other person.

Self-insight does not come easy. Many factors mitigate against it. Central among these is our system of *psychological defenses*—the ways in which we systematically and unconsciously protect ourselves from facing what might be real or imagined threats to our personal security.

These protective distortions—which frequently concern our perceptions of others—help us make reality more palatable. There is no human being alive who is without some pattern of psychological defenses. Unfortunately, the cost of excessive utilization of defenses is the progressive removal from reality. Without some controlled and mild forms of self-delusion, adjustment of the ordinary everyday sort may be difficult. Yet the defenses that we bring into play as we seek to understand ourselves and others seduce us into various states of unreality; they make us see that which is *not* there, and hide that which might be apparent.

In our illustrations of Mike Corey and Jean Krugmeier, not much may have been at stake. However, similar processes, affected by the distortions of psychological defenses, influence decisions of major importance: for example, the selection and promotion of top management personnel, the establishment of budgetary commitments, the theme of advertising campaigns, or the assessment of company performance.

The Force of Attitude

One particularly pervasive pattern of personal defenses found in industry, which interferes with the process of understanding others, is characterized by a high degree of *authoritarianism*, with concurrent *rigidity in perception* and *intolerance for ambiguity*. The authoritarian person seems to need to view the world in clearly defined segments, some strictly black, others strictly white. He does not make much room for gradations—things are clearly good or abominably bad, people friendly or hostile, nations with us or against us. Thus, the authoritarian unconsciously fails to recognize subtle but significant interpersonal phenomena, because he is unable to evaluate shades of gray for what they are.⁸ Extreme non-authoritarian personalities—"nothing is definite—all is a matter of shading"—also encounter difficulties in understanding others since they too have a singularly single-minded view of what the world and its inhabitants are like.

The attitudes with which we approach the task of understanding others, then, do a great deal to determine just what we will be able to see. Attitudes basically serve as organizing forces that order in some preliminary manner the potential chaos and complexity confronting us. They give meaning to what we are prepared to see and hear. As such, they serve a necessary and useful function.

"Playing the Odds"

The question of whether the holding of stereotypes is necessarily detrimental to accurate social perception deserves consideration. If we define a "stereotype" as an *inaccurate* perception of a given grouping, it follows logically that stereotypes are hindrances. But, more generally, we *do* need to be able to type people by means of broad and flexible generalizations.

⁸ See T. W. Adorno, E. Frenkel-Brunswik, D. J. Levinson, and R. N. Sanford, *The Authoritarian Personality* (New York: Harper & Bros., 1950).

In that sense, a realistic view of a group of individuals (a kind of "accurate stereotype") may increase the odds for accuracy in our perception of others. Thus we may make assumptions about the characteristics of a specific company's board of directors, about the honor graduates of a college, or about women secretaries. We frame enlightened guesses concerning the manner in which a directive will be interpreted by first-line supervision, the way in which a sales campaign on bottled beer will be received by the housewives in Suburbia, or how the new profit-sharing plan suggested by the union's bargaining committee will strike the company attorney. This kind of "typing," while based upon prior perceptions of individuals and groups, necessarily is a kind of oversimplification; still its use in a consciously wary manner is a constant necessity if we are to relate to people.

Since understanding people involves relative probabilities of being right, caution is always in order. We must ever attempt to remain open to a constant flow of new information which may help us alter our perceptions in the light of changing circumstances. It is the danger of fossilization—the pitfall of "hardening" perceptions irrationally—that needs to be avoided.

Link Between Perceiver and Perceived

The personality of the perceived also determines the success of social perception. Ultimately it is the relationship that emerges between perceiver and perceived which becomes crucial. *Communication* linking the two—the sending and receiving of messages (involving feelings as well as content)—becomes raw material underlying the process of understanding others. Cues are messages from the perceived to the perceiver. In each instance, the perceiver "samples" certain small units of behavior that come from the perceived. While these samples in a statistical sense are neither random nor necessarily representative, they form the basis for generalizations that constitute predictions

about the behavior of others. As communications develop, a person becomes both perceiver and perceived—sending and receiving cues of great variety and with high speed.

In the relationship between perceiver and perceived it becomes important for the perceiver to elicit cues from the perceived which will do the most to reveal, on a sample basis, the relevant aspects of the perceived's feelings, thoughts, and potential behavior. This ability to break through a person's outer veneer, to penetrate false fronts, has two facets: (1) the perceiver's *skill in facilitating the "sending" of cues* by the perceived, and (2) the perceiver's *skill in picking up and interpreting properly* the cues that have been sent.

Jean Krugmeier, for example, by eliciting fully the attitudes and aspirations of her job applicant might have succeeded in bringing to the surface relevant cues that might have made possible a more sensible evaluation of his potential. She might have reduced the applicant's defensiveness by proving herself receptive to his comments and accepting of him as a person, by listening for his feelings as well as meaning, and by communicating to him her understanding of his point of view.

As we engage in the process of understanding people, our hope for ever increasing accuracy rests partially with our ability to get *feedback* on how others view the accuracy of our perceptions. We must remain in tune with the reactions of others—not in order to become blind automata, but rather to double-check and review the validity of our own perceptions.

The Danger of "Expertise"

Usually we receive feedback from members of our own *reference groups*—our families, friends, and business associates. These are the people whose opinions about us usually matter to us. Especially parents and close relatives who have provided us with experiences which make us what we are often continue to give us,

as Robert Burns so aptly put it, "the giftie . . . to see oorsels as ithers see us."

At times, the validity of our insights and understanding of people is assessed by experts, by psychiatrists or psychologists who have been trained in personality diagnosis and behavior prediction. Unfortunately, research has shown that some of these experts, in spite of their intellectual grasp of interpersonal relations, are rather inept judges of people. This startling paradox has some rather persuasive explanations to account for it. First, intellect alone—though a slight help—does not guarantee empathy. More importantly, for some people too much knowledge is a dangerous thing! For them, there exists the danger of *overreaching*. They are confronted with the ever present temptation to read into cues complex "deeper" meanings which in reality may not be there at all. This is the pitfall of imagining psychological ghosts behind each casual remark, simply because of some intellectual predisposition to make interpretations at more esoteric levels.

For experienced clinicians, the process of feedback here again proves to be a partial safeguard. If all too often our views of others, though psychologically "sophisticated," find no confirmation, either by the subject of our perception or through the preceptions of other observers, we may suspect that we are overreaching in our search for perceptual accuracy.

The Situation: Arena for Feelings

Regardless of the specific situation in which social perception takes place, some positive feelings of varying intensity will be exchanged between perceiver and perceived. These feelings condition the process of social perception. They set up *halos* which reduce the accuracy of empathic judgments. If we believe that some persons "can do no wrong," if we are enamored of their righteousness and virtue, if we blindly approve of everything they do—we will be unable accurately to assess their less desirable

characteristics or behaviors. The inverse is equally true; pervasive hostility and prejudice also obliterate any chance for a realistic appraisal of people's positive characteristics.

A more subtle manifestation of the impact of feelings on perceptual accuracy can be found in the process of *naive projection* (assuming similarity), the attributing by the perceiver of his own characteristics to the perceived. If few cues are available to the perceiver, if he is unable to utilize those that are available, or if his feelings toward the other person are in fact similar to those he has about himself, projection may become his significant *modus operandi*. The vacuum that might be filled by meaningful cues is taken up by assumptions implying that the perceived resembles the perceiver.

Assuming similarity to another person is neither intrinsically a barrier nor a block to accurate social perception. If the perceived really is much like the perceiver with respect to the characteristics involved in the judgment, assuming similarity is clearly warranted. Although some unique psychological perceptual skill may or may not have been at work, accurate social perception will result.

One can visualize an extreme situation in which the major prerequisite for social perceptual accuracy is the knack for picking out associates who resemble us with regard to relevant personality dimensions. If we succeed in this selection, be our choice conscious or unconscious, all we may need in order to understand them is to assume that they are, more or less, replicas of ourselves. Obviously, reality rarely permits this uncritical, though convenient, approach. More likely we may find that we assume similarity where none exists, thus hindering social sensitivity by the unwarranted assumption.

A blind assumption, on the other hand, that we do *not* resemble others (or a particular "other") can also lead to misperception. In most cases, the perceiver and the perceived do

share in common some attitudes, feelings, and similar personality characteristics. The challenge confronting us is to recognize those elements that we have in common with other individuals, while at the same time noting the differences that make us unique. Likewise, when dealing with many people, we need to learn to discriminate the relevant differences among them, while remaining aware of the similarities which they, as a group, share. Thus, as a particular boss considers a group of subordinates, he must ask—and answer—these four questions:

1. In what respects is each of these persons like me?
2. In what respects does each of these persons differ from me?
3. In what ways do all these people resemble one another?
4. In what ways is each of these people unique from every other?

Clearly, this is a large order.

The *relative stress* with which people relate to one another also influences their ultimate empathy toward each other. As superiors, for instance, we may find it relatively easy to size up properly the feelings and attitudes of our subordinates; as subordinates our anxieties may becloud our perceptions of our superiors' intent and attitudes. The well-known phenomenon of "seeing red" when angered and the notion that "love is blind" represent classic illustrations of the befogging effect of strong emotions on social perception. Most accurate social perception, it seems, occurs under conditions which do not involve extremely charged feelings.

Because each individual approaches the task of social perception in his own particular situation, his personal receptivity will be influenced by the nature of this situation. An executive who operates in an environment of "yes-men" may come to be attuned to hearing "yes," even if the real sound is more like "maybe." An amusing cartoon series of medical specialists

on vacation shows a plastic surgeon fascinated by the Sphinx in Egypt, a urologist intrigued by the shapes of swimming pools, and a gynecologist marveling at the fertile life in the farm's pigsty.

The *broader culture*, too, provides certain expectations and highlights specific types of cues. The "Man in the Gray Flannel Suit," the "Rate Buster," the "Organization Man," the "Huckster," the "Tycoon"—all of these are cultural types which are readily found on the American business scene, and whose existence is typically recognized by those of us who share a common cultural heritage.

Pay-Off for Empathy

Whatever its correlates and roots, empathy provides a "road map" defining properly the social world confronting the perceiver. There is no guarantee, however, that even the most understanding perceiver will be able to behave appropriately, even if his road map is clear and accurate. He further requires an adequate repertoire of behaviors—*behavioral flexibility*—to provoke the kinds of action that will most effectively attain the goals he seeks.

Social sensitivity and social effectiveness do not necessarily go hand in hand. In *The Outsider*, Colin Wilson^{*} draws the portrait of the cultural hero who sees too much, whose perceptions penetrate all too well, but who tragically lacks the customary social skills for functioning within the reality that he perceives.

"Seeing too much," if not buttressed by an appropriate range of available behaviors, can indeed prove a threat to self and others and thereby reduce ultimate social effectiveness. In terms of actual pay-off, having too much empathy may well be as detrimental as having too little. Seeing the surrounding social world in proper perspective is useful only if knowledge can be successfully implemented by action.

As an executive faces the myriad decisions

^{*} Colin Wilson, *The Outsider* (Boston: Houghton Mifflin Co., 1956).

he needs to make, it becomes quite clear that he must master two tasks: he must learn to see accurately the human, as well as the inanimate, factors of the total scene; and he must acquire the skills of action which, while based upon accurate perception, tap well-springs of behavior that ultimately lead to the successful attainment of personal and organizational goals.

Social effectiveness can be developed. For some people, dealing with feelings is as easy as recognizing and manipulating facts. For others, the world of emotions is mysterious indeed. The improvement of social skills is a many-sided challenge. Neither intellectual learning nor emotional experience alone suffice. Nor is the heightening of social sensitivity the sole sacrosanct cure-all. Experiences are

needed that reach the full personality. Increased social effectiveness depends on a "tool-kit" of appropriate behaviors, in addition to enhanced understanding of social situations. Special clinically-oriented training experiences¹⁰ hold promise to bring about integrated intellectual, emotional and behavioral learnings that can make for greater effectiveness in dealing with others.

¹⁰ Sensitivity Training is one approach designed to improve a person's social sensitivity and behavioral flexibility. For a description see, for example, Irving R. Weschler, Robert Tannenbaum, and John H. Zenger, *Yardsticks for Human Relations Training*, Adult Education Association Monograph No. 2 (Chicago: Adult Education Association, 1957). Similar programs sponsored by the National Training Laboratories in Group Development are described in numerous publications, especially those authored by Leland P. Bradford.

If a man does not keep pace with his companions, perhaps it is because he hears a different drummer.

Henry David Thoreau

HAROLD KOONTZ

Management Control: A Suggested Formulation of Principles

This analysis of the control function challenges both the student of management and the manager with the task of developing a theory of management.

Although the need for improving management in all kinds of enterprise is widely recognized, and although much inquiry into management and the training of managers is being undertaken, there is serious question that enough attention is being given to formulating a conceptual framework from which to approach these important tasks. Much of both research in management and training of managers seems to have been proceeding from the questionable premise that exchange of experience and emphasis on technique are adequate to meet the widely recognized need for improving the quality of management.

One cannot deny the importance of analyzing experience through case study or research, or of giving managers lessons in "how-to-do-it" as indicated by experience. But particular techniques of dealing with problems must be passed on with care since these are not always transplantable from one manager to another or from one enterprise to another. What can be transferred, however, are the generalizations

that can be distilled from specific situations. Generalizations—or principles, which can be applied in certain areas and which have a predictive value in guiding thought and action in these areas, can be a practical means of understanding and improving management. And if these principles can be arranged logically in a conceptual scheme, they can furnish the elements of a useful theory of management.

Control is one of the most widely discussed and studied areas of management. Yet it is a functional area in which little attempt has been made to formulate principles that might be useful to practicing managers, helpful in training them, and suitable for guiding research. Considerable attention has been given to organization principles, and the basics of formal organization have been so well recognized and explained that most research and practice in organization show a clear awareness of theoretical implications, an awareness which may account for the relative effectiveness of most managers in organizational matters. Some at-

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tention has been given to the codification of principles of planning.¹ But rather little has been given to formulating and codifying principles of control, staffing, or direction.

This is not to say that principles of control cannot be found. A number of profound inquiries have been made in this area, many basic truths have been highlighted, and great contributions made, but they lack the refinement, completeness, and codification found in organization. In other words, while many individual principles of control have been recognized by such scholars as Frederick Taylor, Henri Fayol, Chester Barnard, Billy Goetz, Lyndall Urwick, and Joel Dean as well as by many practicing business managers, the entire area has been inadequately reviewed and summarized.

The development of such activities as medicine, dentistry, engineering, music, and agriculture has characteristically been towards the evolution of a science, a systematized body of knowledge dealing with a given area and formulated with reference to principles and laws. A mature field of management cannot be developed without a scientific foundation, and a framework of principles appears to be a proper starting place. As Talcott Parsons, himself a scholar in another "young" science, puts it:

It is scarcely too much to say that the most important index of the state of maturity of a science is the state of its systematic theory. This includes the character of the general conceptual scheme in use in the field, the kinds and degrees of logical integration of the different elements which make it up, and the ways in which it is actually used in empirical research.²

In the rapidly evolving programs of man-

agement research and training, there is often so much recounting of experience—without reflecting on what is fundamental in the job of management and without expressing this experience in these terms—that findings tend to contribute only a hodge-podge of structureless facts. If research efforts were realigned to broaden knowledge of principles and to interpret this research in the light of principles, more progress could surely be made towards the development of scientific foundations for management.

Apart from its necessity as a guide for research and for the development of scientific management, a framework of principles is important in training managers. Principles describe the nature of the managerial job, crystallize the purpose of management, and act as a kind of checklist for the manager to follow in practicing the art of management. In doing so, they furnish the basis for seeing the manager's job as a whole and become the cornerstone upon which the training of managers can be undertaken.

Early students of management—eminently practical scholars such as Henri Fayol, Chester Barnard, Lyndall Urwick, and Alvin Brown—felt strongly the need for a body of theory in the teaching of management. For example, in his great classic published originally in 1916, Fayol bemoaned the absence of management teaching in the vocational schools and ascribed it to the lack of theory since, as he said, "Without theory no teaching is possible."³ Similar observations have been made by those now teaching management.⁴

Principles, or theory, and art are not, of course, mutually exclusive. As principles are formulated, verified, and applied in solving problems, they become the working rules of an art. While management will always be an

¹ See, for example, the author's "A Preliminary Statement of Principles of Planning and Control," *Journal of the Academy of Management*, I, 1 (April, 1958). In this paper, originally given before the Academy of Management in 1956, only four principles of control were identified and it was felt that the managerial function of control was largely a technical matter about which few generalizations could be made. Further study and reflection have indicated that this position was incorrect.

² *Essays in Sociological Theory, Pure and Applied* (Glencoe, Ill.: Free Press, 1949), p. 17.

³ *General and Industrial Management* (New York: Pitman Publishing Corp., 1949), pp. 14-15.

⁴ See, for example, Leon C. Megginson, "The pressure for Principles: A Challenge to Management Professors," *Journal of the Academy of Management*, I, 2 (August, 1958), 7-12.

art and perhaps will depend largely on know-how, improvements in the art of management, as in the art of bridgebuilding or missile design, can come from an understanding of principles.

As the working rules of an art, principles can, then, increase managerial efficiency. Probably no task is more complex or has a greater number of variables than that of the manager. The application of principles to this job should facilitate reasoned decisions, might make unnecessary much laborious research and trial-and-error operation, and could show the way to understanding many of the complexities of the task. But unless these principles are clearly related to the job of management and logically organized, their usefulness to the manager and to the researcher will be limited.

CONTROL AS A FUNCTION

In order to see the managerial function of control in proper perspective, it must be regarded in the light of the other functions of the manager. In my opinion, control is one of five major functions of the manager at any level of an enterprise—whether president or foreman—and in every organized enterprise—whether business, government, education, church, or other kind. These functions, all of which are necessary to the job of getting things done through people and all of which differ from those of the engineer, accountant, machinist, or personnel expert, may be summarized as follows:

- A. *Planning*—the selection from among alternatives of enterprise objectives, policies, procedures, and programs.
- B. *Organizing*—the grouping of activities necessary for accomplishing enterprise objectives and the assignment of these groupings to a manager with the necessary authority for undertaking them and with provision for vertical and horizontal coordination of the authority relationships.

C. *Staffing*—the selection and training of subordinates.

D. *Directing*—the guidance and overseeing of subordinates.

E. *Controlling*—the measurement and correction of activities of subordinates to make sure that plans are transformed into action.

It will be readily seen that all of the functions of the manager are so closely interrelated that it is difficult in practice to ascertain where one function ends and another begins. Indeed, in practice these functions tend to coalesce because the operating manager performs all of them virtually at the same time. Planning and control are particularly closely related since the purpose of control is to make sure that plans are accomplished. Any attempt to control without planning would be meaningless since no one can tell whether his subordinates are doing what he wishes them to do unless he first knows what his wishes are. As Goetz has put it, "Managerial planning seeks consistent, integrated and articulated programs," while "management control seeks to compel events to conform to plans."⁵ Plans thus furnish the criteria for control.

Similarly, since the manager accomplishes enterprise or department goals through people and since events can only be made to happen by people, control and organization are closely intertwined. For, just as planning furnishes the criteria for control, so organization defines who must be controlled. Without the assurance that subordinates who are expected to accomplish tasks hold the necessary and coordinated authority, no manager can properly carry out the function of control.

Given the prerequisites of integrated and clear plans and sound organization, the control process is the same wherever it is applied. Whether the manager wishes to assure quality of product, availability of necessary cash, or

⁵ *Management Planning and Control* (New York: McGraw-Hill Book Company, Inc., 1949), p. 2.

derly production, a desired level of inventories, or any other planning goal, the control process involves three steps: (1) the establishment of standards; (2) the appraisal of performance against these standards; and (3) the correction of deviations.

It should be noted that the third control step overlaps other managerial functions. Deviations from plans may, of course, be corrected through additional planning, through better direction, through selecting someone else to do it, through a program of subordinate training, or through reorganization.

CLASSIFICATION OF PRINCIPLES

One of the major purposes of a theory is to explain the nature of a subject by presenting a clear and systematic view of it. With this in mind, it appears that managerial control can be analyzed by placing the basic principles of control into the categories of (1) those dealing with the nature and purpose of control, (2) those having to do with the structure of control, and (3) those explaining the process of control.⁶ (The same classification of principles could, no doubt, be used for the managerial functions of organizing and planning, and perhaps also for staffing and direction.)

In placing the principles which I believe to be basic to managerial control within this framework, I must emphasize that this classification is tentative. The classification does appear to have the merit of being widely applicable to all functions of management and it does appear to deal with those facets of management important to the practicing manager. Disagreement as to the classification is expected⁷ and it is probable that others would

identify principles other than those stated in each classification.

Most of these principles are not, of course, original. As will be noted, many of them have been referred to in almost the same language by others who have attempted to dissect the job of the manager.

NATURE AND PURPOSE OF CONTROL

The nature and purpose of managerial control seem to be reflected in five principles, which may be summarized as follows:

1. *Principle of Assurance of Objective:* Controls must contribute to the accomplishment of group objectives by detecting deviations from plans in time and in a manner to make corrective action possible.

It is obvious that the purpose of all organized enterprise is the accomplishment of group objectives, ends which cannot be accomplished by individuals acting alone. This essential fact has been recognized in many analyses of management.⁸

For example, a company's objective in instituting a new product program may be to maximize return on investment; but if, as the program proceeds, a forecast of revenues and expenses indicates that the program (perhaps because of a competitor's action) will yield a negative or a negligible return, control should

have a process, and an effect. In turn, each of these has its principle, process and effect. See Lyndall F. Urwick, *The Pattern of Management* (Minneapolis: University of Minnesota Press, 1956), Chap. 5. As Urwick has often pointed out, this logical scheme was borrowed from Mooney and Reilly, who, in turn, borrowed it from the German logician, Louis F. Anderson. While this system, which leads to neat groups of nine principles, has a certain graphical charm, it does not appear to be as useful or understandable as the one adopted here.

⁶ As Barnard, in his *The Functions of the Executive* (Cambridge, Mass.: Harvard University Press, 1938) pointed out (p. 23), "Cooperation justifies itself, then, as a means of overcoming the limitations restricting what individuals can do" and (p. 82) "An organization comes into being when (1) there are persons able to communicate with each other (2) who are willing to contribute action (3) to accomplish a common purpose."

⁶ The author used a similar classification in his suggested principles of planning. See "A Preliminary Statement of Principles of Planning and Control" (Note 1).

⁷ For example, Urwick, who has perhaps done more than anyone else to develop a systematic theory of management, has classified principles of control (as other principles of management) in a logical scheme based upon the premise that every problem area or subject has an underlying principle, which in turn

make it possible to reconsider the original decision and modify or replace the program before it is too late. If a control were designed to show only the state of progress in the development of the product itself, the company might find itself with a fully developed, but relatively unprofitable new product which had already absorbed its resources.

Therefore, controls must have as their essential reason the attainment of objectives or goals, just as the other functions of the manager must have as their *raison d'être* the accomplishment of objective. In the case of control, this purpose can only be accomplished if the techniques used make it possible to detect failures in plans. This is a simple truth, but one which often is overlooked by the practicing manager.

2. Principle of Efficiency of Control: Controls are efficient if they effectively detect deviations from plans and make possible corrective action with the minimum of unsought consequences.

Chester Barnard has very clearly pointed out the applicability of the scientific concepts of effectiveness and efficiency to systems of human cooperation.⁹ A control may be effective in the sense that it does assure the attainment of objectives, but it is inefficient if it does so at unnecessarily high cost in dollars, hours, lost morale, or individual dissatisfaction.

Techniques of control have a way of becoming costly, complex, and burdensome. It is entirely possible for a manager to spend considerably more than it is worth to detect deviations from plans. And such costs go beyond dollars. For example, a control technique so vigorous and thorough that it negates authority delegations or seriously impairs the morale of those who must execute plans can easily result in costs beyond any possible value it might have. Among the countless instances of costly controls found in practice are

complex engineering procedures and controls which hamstring creativeness and human efficiency, detailed budget controls which place a strait jacket on the manager, and purchasing controls which not only delay deliveries but involve costs beyond the value of the items purchased.

3. Principles of Control Responsibility: Control can be exercised only by the manager responsible for the execution of plans.

The principle follows logically from the two preceding it. If the organization structure, through its delegation of authority and assignment of tasks, gives a manager responsibility for the accomplishment of certain plans or portions of plans, this responsibility cannot be waived without changing the organization. It is logically and practically inconsistent to expect a manager to make and accomplish plans and not to expect him to exercise control to make sure that these plans are being accomplished. Yet this principle is sometimes misunderstood in practice. Some managers expect control to be exerted only from some top point in an enterprise, or they wait to be told from above what controls to exercise and when.

The principle of control responsibility also appears to clarify the often misinterpreted role of controllers and centralized control units. Although these agencies may, in a staff or service capacity, assist the manager by furnishing him information needed to control his department, they cannot assume the part of actually exercising these controls without destroying the unity and meaning of the manager's job.

4. Principle of Future Controls: Effective control should be aimed at preventing present and future deviations from plans.

It has sometimes been said that planning is looking ahead and control is looking back. This seems to be a distorted view of control. Just as planning must be forward looking, so must control. Since the manager cannot pos-

⁹ Barnard, p. 19.

sibly control the past, and too seldom can move fast enough to detect and correct current deviations from plans, his controls should be aimed at the future.

The tendency to regard control as looking back has arisen largely because managerial control has been so dependent upon accounting and statistical data instead of forecasts and predictions. In the absence of any means to look forward, reference to history, on the assumption that what is past is prologue, is admittedly better than not looking at all. But this principle does point to the need for more control information based on forecasts.

One can hardly deny that the alert manager would prefer a forecast of what *will* happen in the execution of a given plan, even though this projection has a margin of error in it, to a decimately accurate report of the past, about which he can do nothing. Of course, what a manager would probably like best of all is a system of control that would operate with instantaneous feedback, like the servo-system of an automated machine tool, so that deviations might be corrected before they occur by means of correcting tendencies to stray from desired performance.

That managers are increasingly looking ahead for purposes of control is apparent from the greater attention being given to expense and revenue projections and the forecasting of cash. Well managed companies always forecast cash requirements carefully for periods varying from four to twenty-four months in advance. By seeing their cash needs well ahead of time, they are usually able through careful planning to provide for them *before* cash stringencies occur. On the other hand, many companies have found themselves in desperate circumstances by suddenly awakening to the fact that they do not have the cash to meet commitments. And it is almost a tradition that cash is difficult to get in emergencies, but easy to obtain if arranged for well ahead of needs.

5. Principle of Direct Control: The most effective technique of control in an enterprise is to assure the quality of subordinate managers.

Most controls used by managers are actually indirect controls because they are based on the need to keep subordinates, particularly managerial subordinates, from making mistakes. Unquestionably, the best and most direct kind of control is to assure the best possible quality of managers. Able and well trained managers plan well and thoroughly, delegate authority, assign tasks, and do the most effective job of selecting, training, and directing subordinates. They make fewer mistakes and require fewer indirect controls.

THE STRUCTURE OF CONTROL

A second group of three principles are significant for the structure of control techniques, particularly in their relation to plans, organization, and the managerial incumbent.

6. Principle of Reflection of Plans: Controls must be designed so as to reflect the character and structure of plans.

This principle underlines the fact that controls must be tailored to individual plans. Thus, if the control of costs is the aim, the control technique used must be based on planned costs of a definite and specific type. If one would control inventory, clearly the controls must take into account and follow those plans which influence inventory; and true inventory control must be based upon the entire program of production planning and scheduling, purchasing, shipping, warehousing, sales, and finance. Too often, in these and similar cases, the manager deceives himself by thinking he is controlling an aspect of operation when his control technique is not designed to reflect the pertinent plans involved.

7. Principle of Organizational Suitability: Controls must be designed to reflect organization structure.

Since managers and their subordinates are the means through which the events of planning must be accomplished, it follows that effective controls must be applicable to a manager's authority area and must therefore reflect the organization structure. Consequently, any device of control must be tailored to the manager and his position in the organization, and information to appraise performance against plans must be suitable to the manager who is to use it. Urwick has expressed this as the principle of uniformity and has emphasized that "all figures and reports used for purposes of control must be in terms of the organization structure."¹⁰

As can be readily seen, this principle is similar to the principle of control responsibility outlined above. The principle of control responsibility, however, emphasizes that control of events can be exercised only through people, with the manager the focal point of control. But control techniques must be structured so that a certain manager can be held responsible. This can only be done by making the controls consistent with organization structure. It does no good to hold a manager responsible for costs, for example, if the cost reports do not pinpoint which manager in an organization position is responsible. In other words, one principle has to do with the personal responsibility for control, the other with the orientation of control information to the organization structure.

8. *Principle of Individuality of Controls:*

Controls must be designed to meet the personal needs of the individual manager.

An important factor in any system of control is the fact that people do vary in terms of personal biases, training, and ability to comprehend information. No matter how much a statistician, mathematician, or accountant might like to mold a manager into his own image, it is a fact of life that what a manager

cannot understand or will not understand cannot be useful to him for control. What might be a delight to the figure-minded treasurer might be abhorrent to the plant superintendent. What might be meaningful to the chief engineer might be incomprehensible to the sales manager. Some managers may like reports, others tables, some charts, and still others mathematical formulae or curves. Control devices and information are important enough that they should be tailored to these needs.

THE PROCESS OF CONTROL

In the operation of controls, there appear to be six principles which point to the most effective possible techniques of control. To be sure, control, being so much a technique, rests heavily on the art of management, on "know-how" in a given instance. But experience in control yields certain benchmarks which no manager should overlook in practice.

9. *Principle of Standards:* Effective and efficient control requires objective, accurate, and suitable standards.

Standards are authoritative criteria by which performance can be measured. The principle of standards implies that every plan must have measures of effectiveness which are as specific and simple as possible and which accurately measure whether a planned program is being accomplished.

Not only are such standards highly desirable from the standpoint of giving the manager a precise measurement of operations in relation to plans, but they are desirable because events are controlled through people. Actual performance is sometimes camouflaged from the manager by a subordinate's sparkling or dull personality or by his ability to "sell" a deficient performance. Thus measurements of performance that are not objective can often be wrong. Moreover, good standards objectively applied as a measure of a subordinate's performance are most likely to be accepted by the subordinate as fair and reasonable.

¹⁰ Lyndall F. Urwick, *Elements of Administration* (New York: Harper & Brothers, 1943), p. 107.

10. *Principle of Strategic Point Control:*

Effective and efficient control requires that attention be given to those factors which are strategic to the appraisal of performance.

It is ordinarily wasteful and unnecessary for a manager to follow every detail of the execution of plans. What he must know is that plans are being executed in such a manner that their goals can be accomplished. He should, therefore, concentrate his attention on selected parts of performance which will indicate whether significant deviations in the total plan are occurring or will occur.

There are no easy guidelines which might be applied by a practicing manager to determine the strategic points he should watch, since the selection of these is predominantly a matter of the managerial art. Perhaps the manager can reach his own solution to the problem by asking himself what things in *his* operations will show *him* best whether the plans for which he is responsible are being accomplished.

11. *The Exception Principle:* Efficiency in control requires that attention of the manager be given primarily to significant exceptions.

This principle, which was pointed out many years ago by Frederick Taylor,¹¹ is sometimes confused with the principle of strategic point control. But they are essentially different concepts even though both have to do with the utilization of standards. Strategic point control refers to the selection of certain key factors which determine whether performance conforms with plans, while the exception principle has to do with watching for (and taking action with respect to) significant deviations at these points.

The difference between the exception principle and the principle of strategic point control can be illustrated by the techniques a sales manager might employ to control field sales.

¹¹ *Shop Management* (New York: Harper & Brothers, 1919) pp. 126-127.

He might select as critical points to watch such items as sales per salesman, sales by products and by territories, or gross profits from sales by product. However, in watching these critical points, he would see no need for action unless he detected deviations beyond limits which he regarded as normal, that is, deviations which constitute noteworthy exceptions.

The exception principle is often quoted as an essential requirement of managerial control efficiency. However, the manager who first chooses the fewest practicable strategic points to watch, and then concentrates on exceptions increases his efficiency markedly. The necessary number of strategic points to be watched will depend upon the importance of the plan and the extent to which strategic points showing progress under the plan can be found or devised. This difference might be illustrated by practices in quality control. It may be important to test carefully every part of a missile guidance and control system and hold each part to close performance tolerances; but in the missile fuselage shell there might be only few points to be checked, and the allowable tolerances might be relatively broad.

12. *The Principle of Flexibility of Controls:*

Controls should incorporate sufficient flexibility to remain effective despite the failure of plans.

Stated negatively, this principle, first given clear form by Goetz,¹² means that controls should not be so inextricably bound into a particular plan that, should unforeseen events or shifts in goals make the plan unworkable, all control is lost. This principle is best illustrated by the considerations which led to the flexible, or variable, budget. Such budgeting, which provides for budgets to be changed quickly and virtually automatically if the business outlook changes, arose from fears that under fixed budgets control might be lost through continu-

¹² Billy E. Goetz, *Management Planning and Control* (New York: McGraw-Hill Book Company, Inc., 1949), p. 229.

ation of managerial authority to spend at a level determined by previous sales forecasts but not justified by actual sales volume.

While this principle is difficult to implement in practice, the manager should be aware of the desirability of such flexibility. Otherwise, the manager may go along blithely thinking that he has proper control of the execution of a plan, only to find that the situation for which the plan was tailored has been changed. Many managers tend to lose control over the costs of new product programs when the unforeseen difficulties of such ventures cause costs to mount—while the elusive rabbit of completion seems to be around one more corner.

13. *Principle of Review:* The control system should be reviewed periodically.

Because of the dynamics of enterprise and the environment in which it operates, not only should controls be kept flexible but the system and techniques of controls should periodically be reviewed. Controls, like plans, are never final. Just as the manager should continually re-evaluate his plans and take navigational readings to see if he is on course, so should he periodically and systematically review his controls to make certain that the standards

used, the strategic points selected, and the tolerances permitted are consistent with his plans and goals.

14. *Principle of Action:* Control is only justified if measures are undertaken to correct indicated or experienced deviations from plans through appropriate planning, organizing, staffing, and directing.

Control is meaningless and wasteful and the application of the principles above a fruitless exercise unless action is taken to correct deficiencies detected. These corrections may be in the form of revised or new plans, new or different delegations of authority and assignments of tasks, better training or selection of subordinates, or a better order of counseling and guidance by the manager.

This principle not only underscores the action aspect of control but also the fact that control tends to coalesce with the other functions of the manager. It emphasizes the basic unity of management and the essential fact that control functions cannot be delegated, cannot be centralized in a staff or department which does not have the authority to execute a plan, and cannot be taken away from the manager without destroying managership itself.

... the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. . . . Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist.

Lord John Maynard Keynes

FRED E. CASE

FRANK G. MITTELBACH

Management Problems and Practices of Real Estate Firms¹

What role does management play in real estate firms? What role can it play?

Industries largely comprised of small firms have in the past not received the full attention of students of management. One of the reasons is that such industries give less scope to managerial ability; technical skills loom larger. Business organization and operation is relatively small and simple, and the executive is much closer to the operations of the firm. This study of the real estate brokerage business represents an effort to bring into focus some of the managerial problems and practices encountered in an industry dominated by small firms. In addition, it attempts to suggest some managerial factors that have permitted some firms to grow despite the fact that the structure of the market and the firms seem to make this difficult.

Preliminary observations of real estate brokerage firms in California suggest that few firms are consciously aware of management

policies and principles. Furthermore, only a minor proportion of the firms—even though they may become management conscious—examine their operations from the point of view of management performance. They tend to carry out their management functions intuitively rather than consciously, and in many cases emphasize one or the other management function without fully recognizing the implications this has for the over-all profitability of the firm. The general lack of management awareness within the industry has permitted firms to grow and prosper whose managements have performed better because of their experience or perception rather than because they have adopted a positive approach of recognizing the specific tasks of management.

These observations are the result of a four-year study of 89 successful real estate brokerage offices consisting of from one to more than 75 persons and located throughout the State of California. A successful firm was assumed to be one which had maintained a reasonably stable or increasing level of net profits, was classified as "successful" by its competitors,

¹ This study was financed by the Real Estate Research Program, University of California, Los Angeles. The authors would like to express their appreciation to the many real estate executives who have given so freely of their time in cooperating on this project. The authors, however, are solely responsible for the views they express.

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and had one or more persons who had provided leadership in either local or state organized real estate activities.

The firms thus selected were subjected to intensive analysis, which included a study of the financial records for the four year period, 1953 through 1957, depth interviews with the principal members of the firm (except in the case of the larger organizations where a sampling of interviews was completed with selected personnel), and the development of case histories of the firms' operations from the date they had started in business.

This report covers only a portion of the total study and concerns itself largely with over-all management performance, and less with technical aspects and the legal framework within which the industry operates.

CHARACTERISTICS OF REAL ESTATE BUSINESS

The real estate industry provides a fruitful field for a study of the application of management principles. Rapid growth of the industry in the last decade and a high degree of industry competition have forced the various firms to search for something more than "personality" or "technical skill" in order to maintain satisfactory profit levels. This search has been difficult and has been marked by numerous business casualties. A recurrent theme uncovered by this study is the search for panaceas in the form of techniques, without a full understanding of their effectiveness or ineffectiveness in the light of over-all inadequate management performance.²

During the five-year period following the close of World War II, the seller's market permitted many firms to operate and to increase volume simply by adding to their staffs. The chief problem was one of obtaining merchandise properties to sell; the ability to solve

this was frequently the difference between success or failure. While real estate activity continued at a very fast pace after 1950, the number of individuals selling real estate grew even more rapidly.³ As a result, the real estate manager for the first time faced the fact that he or someone in the firm must have something more than mere sales ability. By 1953, the search for this "something else" had reached a more acute stage in the face of relatively lower earnings, small-scale operations, and the inability of the majority of the firms to achieve even a modicum of growth.

In 1953, there were 100,148 persons (approximately one out of every 120 persons in California) licensed to sell real estate, but only 46,000 were actively engaged, either full time or part time, in real estate activity. The gross earnings of these persons from all their real estate operations amounted to 400 million dollars and they retained 200 million dollars in net income.

Even though the dollar volume of net income was high for the industry, personal annual income averaged only \$8,250 for the broker heading a firm, \$4,500 for the self-employed broker, and \$4,200 for the broker and \$3,500 annually for the full-time salesman employed by others (Table 1). The median age of these persons was 44 and 49 years for salesmen and brokers respectively, reflecting the predominantly middle-aged character of both the managers and their employees. In addition, the typical real estate business manager had little formal education beyond high school and past business experience was mainly in the field of selling.

³ The evidence here is sketchy since the number of real estate licenses in the state does not properly reflect the persons actively engaged in the real estate business. We may posit, however, that an increase in licenses at a more rapid rate than real estate activity probably had the effect of increasing competition. Comparing 1950 and 1956, the number of real estate licenses in the state of California increased by 38% and real estate activity as measured by deeds recorded rose 16% in the three major metropolitan areas of San Francisco, San Diego, and Los Angeles.

² The real estate industry is by no means peculiar here. See for example, L. Urwick, *The Elements of Administration* (New York: Harper and Brothers, 1943), p. 15.

TABLE 1
MEDIAN CHARACTERISTICS OF ACTIVE REAL ESTATE LICENSEES, CALIFORNIA, 1953

Characteristics	Identification of Personnel ¹			
	All Brokers ²		All Salesmen ²	
	Full Time	Part Time	Full Time	Part Time
Number.....	16,150	9,840	10,375	8,175
Per cent male.....	81%	82%	72%	66%
Age.....	51 yrs.	48 yrs.	45 yrs.	44 yrs.
Years in real estate business.....	9 yrs.	8 yrs.	2 yrs.	3 yrs.
Education	H.S. Grad.	1-yr. Coll.	1-yr. Coll.	H.S. Sr.
Net earnings—total.....	\$5,500	\$1,900	\$3,500	\$600
Head of firm.....	8,250	3,500		
Self-employed.....	4,500	1,000		
Employed by others.....	4,200	1,500		
Age of entry into business.....	39 yrs.		38 yrs.	
Previous Experience:	Heads of Firms ³		All Selling Personnel ³	
Real estate selling.....	40%		19%	
Non-real estate selling.....	25%		28%	
Non-real estate, non-selling.....	35%		43%	

¹ The classification of Broker and Salesman is related to the type real estate license held by the individual; selling personnel includes brokers and salesmen.

² Sherman J. Maisel and Albert H. Schaaf, *Characteristics and Performance of Real Estate Brokers and Salesmen in California* (Berkeley: Bureau of Business and Economic Research, University of California, 1956) Tables 4, 5.

³ Fred E. Case, *A Preliminary Study of California Real Estate Brokerage Firms* (Los Angeles: Bureau of Business and Economic Research, University of California, 1957) Tables 9-9, D-16.

The majority of the 22,169 firms in existence were "small, highly competitive and received a relatively low income." (Table 2.) The large number of firms indicates the ease of starting a business where only a license to sell and a business address are needed to begin operations. One-third of these firms consisted of more than one person organized into some form of legal business organization, one-third consisted of only a broker and one-third of a loose organization of part-time selling brokers.

In spite of the generally low net incomes of the typical real estate firm and its sales personnel, 37 per cent of the firms with employees did earn more than \$25,000 annually in gross income, or \$6,000 more than the typical firm. It was among this latter group that the present investigations were started, although some

large and small firms with somewhat lower incomes were included for purposes of control.

NATURE OF MANAGEMENT PROBLEMS

After various approaches to classifying the firms were tried, it was found that classification according to the number of employees within a firm was the most fruitful. Thus firms with five or less employees were considered to be "small," from 6-25 employees "medium," and more than 25 employees "large." Of course, in comparison to other industries, practically all the firms were small. The highly localized and personalized nature of the business inhibits growth. This would be true even though entry should be severely limited through more stringent licensing requirements.⁵

⁴ Sherman J. Maisel and Albert H. Schaaf, *Characteristics and Performance of Real Estate Brokers and Salesmen in California* (Berkeley: Bureau of Business and Economic Research, University of California, 1956), p. 15.

⁵ More rigorous licensing requirements should lead to a reduction in the number but not necessarily the size of firms. However, this can occur only if there is a close relationship between licenses and firms in busi-

TABLE 2
SELECTED CHARACTERISTICS OF 89 REAL ESTATE BROKERAGE OFFICES, 1953

Description of Characteristics	Size of Firm		
	Small	Medium	Large
Median age of business operations.....	1 yr.	2.5 yrs.	8 yrs.
Percentage of business time spent on brokerage.....	100%	93%	90%
Percentage organized as single proprietors.....	85%	67%	44%
Percentage of firms keeping certain records:			
Income and expense statements.....	84%	95%	100%
Financial budgets.....	36%	43%	47%
Sales ledgers (records of sales completed).....	15%	19%	32%
Business policy book.....	22%	48%	61%
Selected personnel practices:			
Percentage providing sales training.....	56%	90%	100%
Percentage with some type of training program for new salesmen.....	32%	58%	43%
Percentage using some method of controlling salesmen's activities.....	60%	78%	75%
Percentage without bonus or incentive plans.....	69%	50%	35%

Source: Fred E. Case, *A Preliminary Study of California Real Estate Brokerage Firms* (Los Angeles: Bureau of Business and Economic Research, University of California, 1957), Tables 9-9, D-16.

If relatively large size is achieved, it is partially through the medium of branch offices and diversification of activities. The reason for this phenomenon is that offices which engage strictly in the selling and listing of properties seldom find it profitable to operate further than 5-10 miles from their places of business. Not only the "friction of space" limits the area of operation, but also the necessity for being close to a neighborhood so as to keep in touch with the local market.

The predominance of small firms, as defined here, with limited earning potential and performance, is the most striking feature of the real estate brokerage business. While small firms dominate the industry, the present investigations (started in 1953) indicate a universal drive to expand the operations of the firm.

In California licensed salesmen must work under licensed brokers. However, many licensed brokers work in the capacity as salesmen, and are not independent businessmen. A stiffening in licensing requirements for brokers in recent years has resulted in slower growth of brokers' licenses, but may have encouraged many of the brokers working previously as salesmen to go into business on their own.

And, indeed, it is evident also that a number of firms in the industry have been able to increase their activities, staff and income. The highly local nature of the real estate market, the ease of entry and exit, and the relatively minor capital requirements are, of course, conducive to a large number of small firms in the industry. But some firms are nonetheless able to enlarge the scope of their operations.

This study of the real estate brokerage business, therefore, started with an investigation of why more small firms did not or could not expand their earnings and staffs. It does not suggest that there is a necessary correlation between size of firm and net income—quite the contrary. A definite correlation, however, between size and gross income of the firms in this study was found. This merely emphasizes the difference in management ability that may exist at all levels of operation.

After an intensive period of data collection and assembly bearing on this problem, it became evident that a case history approach also was indicated in order to increase the depth of

the analysis. After classifying these case histories according to employee size, the results presented here became clearer.

PROBLEMS OF SMALL FIRMS

Small firms are usually started by a highly productive salesman who leaves another office in order to be able to keep the entire sales commission for himself rather than sharing with the owner of the firm. The sales momentum which he has developed in his former position carries over to his own operations, so that the early period of the life of the business is marked by continuing high sales. After perhaps one or two years of operation, as the owner finds non-selling business details encroaching on his time, this momentum is no longer sufficient to maintain sales. At this point, he may invite one or two salesmen to join him in his operations, and from now on his method of operation will determine whether he will survive as a high-income or low-income small firm. If he falls into the trap of employing his staff merely to contribute a portion of their commissions to his personal income without fulfilling properly his function as a manager, then his salesmen may be motivated to leave him to enter business on their own if they can qualify for a broker's license, or they may join another firm. In the latter case, they will probably seek out a firm where management is more concerned with providing services to the staff that will be conducive to sales activity which benefits the staff as well as the firm as a whole.

The low-income small firm usually survives chiefly because the owner is a top-flight salesman rather than a good manager. He feels that his function within the firm is one of "first among equals." If the firm is in a growing community—which in California includes the majority of urban areas—and the firm has not been subjected fully to the rigors of the competitive process, it will continue in business. The "technical" ability of the owner, his participation in community activities, his insist-

ence on high ethical standards of operation on the part of his associates are usually sufficient to keep the firm operating even though occasionally the net return to the owner is lower than his earnings were as a sales associate with another firm. Status as an independent businessman is frequently an important motivation for starting or maintaining a firm.

The sales associates in these low-income firms receive little guidance or service from the firm. Because the turnover of personnel is quite high, replacements are constantly sought. Salesmen often receive commissions paid at rates prevailing in the local community rather than on the basis of the firm's ability to pay. This may create a particularly acute problem if the firm provides few services to the staff that would permit them to raise their sales activity. Financial records are quite rudimentary so that the executive cannot estimate the overall financial position, let alone the amount of commission he can afford to pay.

By contrast, small high-income firms pay closer attention to their personnel programs. The size of the staff is deliberately kept small, so that direction and control of the personnel can be consistent with the maturity of the organizational pattern. In fact, the small high-income firms frequently have records, systems and policies which permit their expansion and adjustment to business growth. They have a nucleus for a growing organization and often develop into medium-sized high-income firms. Furthermore, the properties they have listed exclusively and over which they have control are viewed as "merchandise in stock." No undue effort is wasted in marketing properties which, in price and quality, do not measure up to the standards of the firm.

In general, the owners of small firms feel that they can add staff if market conditions improve considerably. Seldom do they fully realize that the competitive process will encourage new firms to enter the market if conditions improve and/or they are located in an area of

growth. Few of the owners of these firms make any attempt to analyze market data and to make reasonably educated estimates of future events. Rarely do they read more than an occasional report of current market trends, and this reading is more for the purpose of providing sales arguments than for business planning.

In the aggregate, then, we find that continuity or discontinuity in business of small firms is due primarily to the "personality" and "technical ability" of the owners. A higher income is earned, however, by those firms in which the owners have developed programs consistent with good staffing and directing principles and have records which permit more efficient control. Organizational problems are avoided by keeping the staff small. Long-range planning is ignored and short-range planning is minimal, because the owners feel that they have little control over their future operations.

PROBLEMS OF MEDIUM FIRMS

Not all of the owners of small firms are content to accept such conditions. Because some owners recognize that many of their problems are a function of their small size, they plan for growth. In fact, insofar as could be determined, medium-sized firms nearly always start as small firms.

A primary step in the direction of growth is the hiring of a sales manager who is given the authority to select, train, and direct all salesmen. The augmented sales force requires administrative support, and the owners usually find it necessary to add more secretarial personnel. The complex of personnel thus developed encourages the owner to design an organization in which authority is defined and assigned. A key weakness is the all-too-frequent assignment of responsibility without commensurate authority. Furthermore, some brokers hire sales managers in order to permit the broker to continue with his selling activities. In essence, they attempt to side-step their over-all management responsibilities. To their chagrin,

they find often that sales managers are not as effective as expected.

If properly conceived and executed, the use of sales managers and the creation of a more complex organizational structure permit the owners to devote their attention to other means of producing income. Accordingly, then, the medium-sized firm usually diversifies its activities by adding such operations as property management, insurance sales, and loan correspondencies. These are often marginal profit operations, although the lack of adequate records prevents many of the owners from locating these new activities as the source of their financial problems. This study noted particularly that problems arise, with correspondingly low profits and financial crises, when the owners are unable to recognize what proportion of their time and resources should be devoted to these marginal activities.

Quite apart from weak control systems which do not permit analysis of which part of their profits could be traced to marginal activities, few principals have any notion of what the potential profitability is of the various alternatives available to them in their business operations. This means that marginal activities are treated primarily as by-products which may take up the slack in other business activities. Rather than being regarded as an integral part of the business, they are often seen only as a "service to the clients."⁹

The chief difference between the low-and-high-income medium-sized firms can often be traced to this very ability of the owners to achieve a proper balance among selling personnel, the staff needed to support them, and the expansion of the non-selling activities. The control function becomes pre-eminent at this point: high-income medium-sized firms main-

⁹ A typical example of this attitude is reflected in brokers who act as insurance agents. Their sales activities bring them in contact with persons desiring insurance for their homes, and brokers "skim the cream." Very seldom do they analyze this aspect of their business in terms of its over-all contribution to costs and profitability.

tain their position by developing the records necessary for measuring performance and establishing controls. This type of firm begins to think in terms of business policies. A rudimentary policy-book, which lists the principal guidelines by which the staff may be assisted in negotiating with clients, working with each other, and achieving necessary sales volume, is standard equipment in such firms.

Medium size is a critical phase for many businesses. Not always convinced that they should be managers, brokers continue to concentrate on the technical aspects of the business on the one hand. On the other hand, they are frequently unable to cope with the managerial aspects because they do not recognize what their functions as managers are. The result of this dilemma is a reduced volume of operation and many of the firms become small again.

In summary, we find that in the medium-sized firm, the managerial functions begin to assume equal stature with technical ability and personality as the key to successful operations. We begin to see traces of lines of authority, though they are frequently ill-defined, and find more selective policies and procedures for filling positions in the firm. Controls are instituted, but they are usually checks on the past activities of the staff, rather than attempts to avoid future mistakes. Even if the controls are based on projections, no action may be taken. Policies for channeling the activities of the staff in the most remunerative direction rarely exist. The sales meeting, a common device at this level, centers about immediate day-to-day problems; and personal discussions with the staff are limited to problem situations.

If success is achieved, it comes largely from a broad, and often vague, recognition that coordination of the activities of the firm is the job of management. A consistent search for and application of techniques and methods for improving management may slowly lead to a perception of the more fundamental functions of the business executive. With this realization,

managerial techniques are utilized more effectively.⁷

PROBLEMS OF LARGE FIRMS

The large real estate firms are markedly different from the small and medium firms. All of them, however, have slowly evolved from small firms; none of the firms in this study began operations on a large scale. Usually these large firms have been in existence for a decade or more and are organized on a corporate basis with closely held stock and direction centered in a single individual. Brokerage constitutes only one of several business activities, all of which are related directly or indirectly to the sale, exchange, leasing or managing of properties.

The business is nearly always departmentalized on the basis of the various kinds of services performed, although the largest department is usually the brokerage department, which in turn is sectionalized according to the types of properties sold. In essence, we have departmentation according to the services performed. A territorial departmentation arises in those cases where the firm expands via the branch office process, and within these branch offices departmentation may occur again to a more limited extent.

A key factor in the successful operation of larger firms lies principally in the ability of the head of the firm to select and train well-qualified personnel for the various departments and then to give them very broad authority in running their departments. In order to hold

⁷ Firms at this level, for example, institute more precise record keeping. Consequently, they have at their disposal a substantial amount of information which will aid them in their business operations. However, if no action is taken on the basis of the information available, this may lead to a feeling that the records are inadequate and they are, therefore, abandoned. The industry is inundated by ideas and suggestions from well-intentioned individuals. A poorly managed firm may go through a whole series of managerial techniques and reject them as being ineffective without realizing that the causes for their effectiveness or ineffectiveness lie outside the immediate realm of their applicability.

men of this caliber, the remuneration is substantial and net profit-sharing plans are common. Turnover of personnel is considerably less than in smaller firms, and the services that the firm provides to the staff are extensive. The firm may go as far as designing a special merchandising plan for marketing a specific property.

However, a frequent problem encountered is the relatively low level of training within these firms. The firms studied show great unwillingness to hire inexperienced personnel; experience is thought to eliminate the need for training. Among these large firms, we met problems of business continuity raised by the retirement or death of a senior person and problems where senior members of the firm are unable to adjust their thinking to the growth of the firm. That not all the large firms have found solutions to these problems is amply evident.

Since large firms are very much exposed to the rigors of competition, have fixed cost problems, and may lose staff that enters business in competition, survival as a large and poorly managed firm is difficult. The large firms in this study, however, are usually headed by people who have other incomes and do not rely solely on the business for their livelihood; a minor proportion survive with low profits and inadequate managerial performance. Fortuitous investment in real estate often is the means of survival.

The heads of these firms recognize their responsibilities as executives rather than as salesmen and rarely engage in selling. Instead, they develop both the major and minor policies for the operation of their firms, in consultation with their department heads, and see to it that all employees are informed of these policies and required to follow them. More importantly, the directors of the firm usually have the complete responsibility for developing a strong program of public relations and are usually active in a variety of community affairs.

Another distinctive characteristic of these

firms is the amount of advance planning in which they engage. The attention to planning is usually derived from subdividing and building activities of these firms, for these activities may require several years advance-purchase of raw land. Furthermore, many of these firms have had some experience with operations during the depression years of the thirties and the directors feel a strong need for planning operations in expectation of similar periods in the future.

Few of the directors have had formal training in management, except in those cases where younger persons have taken over the business. Consequently the principals are seldom acquainted with and do not use such tools as organization charts, work-progress reports, personnel forms or reports or similar items. Most find paper-work quite distasteful even at this stage; control and flow of information is maintained through personal meetings with department heads and employees, a procedure that is time-consuming and ponderous.

The large firms are similar to firms of other sizes in their evaluation of each activity by its direct and immediate contribution to sales. They give precedence to the needs of the selling personnel, and they maintain constant pressure on the selling personnel to meet quotas. Seldom is there an attempt to improve the internal efficiency of the staff or their relations as a team.

Experimenting with new methods of compensation, such as sales contests, bonus plans and profit-sharing, is common. But, like the smaller firms, the personnel records of large firms are often elementary and personnel practices are naive. Personnel programs are irregular in execution and lacking in many respects. For instance, such things as job descriptions, job analysis, fringe benefits, non-financial motivation or personnel counselling receive little attention. However, one finds a much greater emphasis on planning for future growth in the large firms, and even budgets are occasionally used.

In summarizing the characteristics of the large firms, one can say that here the executives have the clearest understanding of their managerial functions. The process of managing, however, is erratic. On the other hand, the executives are alert to their managerial shortcomings and search continually for means of improving their effectiveness. They realize, apparently, that no one single action will improve the over-all performance of the firm and that the managerial process is continuous.

THE PLACE OF MANAGEMENT

In general, we can say that "personality" and "technical ability" are of vital importance in the success of the majority of real estate offices. As might be expected, good management does become more critical as the size of the firm increases and with it the need for coordination of more and more personnel and activities.

The emphasis on selling, as opposed to the management function, in the small and medium firms appears to derive from the general feeling of the managers of these firms that their business futures are uncertain and competition so keen that they cannot afford to divert their attention from selling. The necessity for meeting competition, in particular, consumes such a large proportion of their time and energies that they have little inclination to attempt other duties. In addition, of course, less management is needed in the small and medium firm.

The majority of the owners of small and medium-sized firms recognize that their jobs might be easier and their earnings more stable if they spent more time managing their businesses, but the erratic character of their earnings makes it difficult to guarantee salaries for the executive talent which might give them the management counsel they need.

A feasible solution for executives under these conditions, and the one which the majority of firms attempt, is to select sales managers who perform partly technical functions of sell-

ing and partly managerial functions in the staffing area; however, even this procedure fails to help the executive because of the relative lack of effective sales managers throughout the real estate industry. In addition, since the remuneration of sales managers is usually based on the sales activity of the staff and less often on net profits, the tendency on the part of such managers is to maximize income rather than to minimize expenses.

The urge for increased and more predictable net earnings leads to the addition of staff and the multiplication of both technical and managerial problems. The inability of the majority of real estate executives to cope with both of these problems is indicated by the fact that there are fewer medium or large-sized firms than one might expect. Both diversification of activities and branch office operations, which are the chief avenues through which growth is achieved, require much more complex relationships. The degree to which good management contributes to the survival of the large firms simply confirms that the need for attention to management is a direct function of size.

If the real estate firm is satisfied with its status as a small business, then emphasis on more refined methods of directing the activities of the staff might result in more effective personnel performance; but the energy, time and money expended for such a program must be measured against the possibly lower cost of simply using the talents of the constant stream of sales applicants which flows through every real estate office. Given the policies of management with respect to future operation, the choice of real estate executives not to use all the tools in the management kit may be good business.

For the small real estate firm, organizational structure creates no problem. Since the chief activity is selling, there is no departmentation. An active program of channeling and directing the activities of the sales staff may create acute turnover problems since salesmen usually do

not respond to it. Yet there is an urgent need for managerial skill to define the duties of the personnel, to select persons able to fulfill their duties and to train them. Formal systems of control are rarely necessary, because communication is usually rapid and effective.

In the medium-sized firms, problems of organizational structure arise, and positive controls with predictive value begin to loom larger. Planning cannot be altogether ignored, but it can be limited to sales forecasts and budgeting of advertising expenditures. That few medium-sized firms are concerned even with this minimum amount of planning is partially evidence of the relative lack of understanding of what is meant by planning and the implicit assumption that tomorrow will be as today—or better.

Only in the large organizations with 25 or more persons and diversified activities and departments, does the full range of management function come into play. A positive approach to planning becomes paramount. The very fact that these large real estate firms are in several markets creates problems as to where the emphasis of the firm's activities should be placed. The complexities of the business operations require more intricate systems and procedures which aid in the decision-making process at the upper level of the organization and relieve top

management of some of the burdens of solving minor or technical problems.

WHAT OF THE FUTURE?

The theory of management has grown together with the size and complexities of business organizations. The most critical need for a management science exists in these large organizations; it is natural, then, that management theory should be pointed in their direction. These preliminary observations suggest that it would be profitable to study more closely the relationships among and emphasis on the various managerial functions and practices in different sizes and types of businesses in various industries.

This in no way denies the proposition that fewer managerial skills are required in smaller firms. However, a positive recognition of the range of managerial functions that are necessary in smaller firms with less complex relationships appears to be indicated. Such a recognition would permit smaller firms to bring into play those managerial skills and practices that are conducive to efficient operation. It would also avoid expenditures in instituting comprehensive managerial practices and procedures that contribute little or nothing to over-all profitability and are merely a drain on the firm's resources.

It will be a shock to men when they realize that thoughts that were fast enough for today are not fast enough for tomorrow. But thinking tomorrow's thoughts today is one kind of future life.

Christopher Morley

Industrial Democracy, Worker Status, and Economic Efficiency

Can industrial democracy work in the United States?

Since the triumph of business unionism in the United States, few workers have questioned seriously the unilateral authority of business managers to establish operating policies and make decisions which implement them for the firms which they manage.¹ Nevertheless, G. D. H. Cole and other writers have suggested that it would be in the best interests of society to give rank-and-file workers an active role in management decisions and policy formation. They contend that the democratization of the management process would result in important psychological, sociological, and political benefits for workers which are *de rigueur* in a rationally organized society. It is questionable, however, whether such an innovation would be compatible with the institutions of a free enterprise system and whether it would accomplish anything that free bargaining between labor and management can not.

The purpose of this paper is to examine the concept of industrial democracy and to focus attention on some of the questions which it raises by describing and analyzing two movements which approximate industrial democracy—the worker-owned mills in the Pacific

coast softwood plywood industry and the system of codetermination in Western Germany.

THE CONCEPT OF INDUSTRIAL DEMOCRACY

The history of capitalism is replete with reform programs designed to improve man's lot by changing the institutional foundations of economic life. Many of these programs agree in two fundamental premises, whatever their variations in detail: (1) material well-being has been immeasurably enhanced by the increase in economic efficiency which resulted from the development of the modern factory system of production which was made possible by the aggregation of financial and real capital; and (2) this increase in material well-being has been purchased dearly in terms of the individual freedom of workers. A common goal for economic reform programs is to attain greater freedom for workers without foregoing the efficiencies of large-scale highly capitalized productive organization.

Guild Socialist writers in England and the Syndicalists in France have argued that the best way to achieve this goal is to develop a system of industrial democracy. Within such a system the workers would have a substantial degree of control over the destiny of the firms

¹ That is not to say, of course, that the nature of management policies is not influenced by the demands of workers for increased wages and improved working conditions.

in which they labor. Guild Socialism calls for the joint participation by unions and industrial associations in economic planning, administration, and control. Syndicalism goes one step further and dispenses completely with management as a group; control of economic activity is to be accomplished through contractual relationships between unions.

One of the most indefatigable spokesmen for industrial democracy is G. D. H. Cole, a leader of the Guild Socialist movement in England a generation ago. In a recently published book in which he outlines how a system of industrial democracy would work and what it could achieve, Professor Cole puts the case for industrial democracy in this way: "... no society can rest on a really democratic basis unless it applies the democratic method to its industrial as well as to its political affairs."² He argues that the inferior economic status of workers as "hired hands" who can be dispensed with, in much the same way as nonhuman resources which the firm no longer finds profitable to employ, is incompatible with citizenship in a democracy. He suggests that if workers were made partners in the enterprises in which they work, subject to dismissal only because of their own shortcomings, their socio-economic status in society would be commensurate with their political status.

According to his plan, workers would be admitted to partnership in the firms which employ them. By partnership, he does not mean ownership which qualifies the workers for a share in profits; rather, he means that the workers would be partners in the management of the enterprise. They would have a voice in all decisions which affect them and they would have a right to alternative employment within the same firm if they were to become technologically displaced on their jobs.

The changed status of workers would call for reconsideration of the method of choosing supervisory personnel. As partners in the en-

terprise, the rank-and-file workers would be allowed a share in deciding under whose supervision their daily work is to be done. Top management and technical personnel would not have to be elected because they would manage "things" rather than function as face-to-face leaders of men. According to Cole this would result in a greater degree of team play than could be achieved by externally imposed discipline and productive efficiency would increase.

The great benefit of industrial democracy would be an elevated status for workers. Rank-and-file workers may not be interested in industrial control except as it directly affects the conditions of their jobs, but they are interested in the status their jobs confer:

The working classes, though they are aware that their power has increased and their conditions have improved in recent years, are also well aware that they are still regarded and treated as social inferiors, and that their status in industry, which allows them to be dismissed at any time, with scant notice, for no fault of their own brands them as an inferior class.³

Cole recognizes that a majority of workers probably have no desire to participate in the control of industry, but he argues that "far from being a reason for leaving matters as they are, it is a strong reason for wishing to make them different."⁴

IMPLICATIONS FOR FREE ENTERPRISE ECONOMY?

Of the numerous questions raised by the concept of industrial democracy, two of the most important are, "Is it compatible with the institutional framework of a free enterprise economy?" and "What impact would it have on social welfare?" We will deal mainly with the first of these questions because the second is too involved for proper treatment in this paper; it soon resolves into a discussion of value judgments which underlie norms of social welfare.

² G. D. H. Cole, *The Case For Industrial Partnership* (London: MacMillan & Co., Ltd., 1957), p. 10.

³ Cole, pp. 17-18.

⁴ Cole, p. 17.

We must, however, acknowledge at least that the concept of industrial democracy challenges some important assumptions about American business practices. The following assumptions are taken more or less for granted by both management and workers: (1) rank-and-file workers have neither the capacity nor the interest to participate effectively in policy-making; (2) efficient implementation of a firm's business policies requires that supervisory personnel be selected by top management; and (3) the goals of workers are not generally the same as the goals of the owners and/or managers of the firms in which they work.

If these assumptions are invalid, or are valid only under certain circumstances, a change in thinking about the social and economic status of workers in our industrial civilization may be both desirable and inevitable. It is entirely possible that the philosophical void which, according to some writers, underlies the profit maximization goal of business managers in a free enterprise economy may be partially filled by the kind of value judgments made by the proponents of industrial democracy.⁵ Certainly the recent history of labor gains would not be inconsistent with such a possibility.

If it is fair to say that the philosophy of American business management is somewhat unclear as to goals, it is equally fair to point out that, while the supporters of industrial democracy are highly motivated to accomplish certain specific ends, they pay little attention either to the difficulties or to the cost of attaining these ends. Cole argues that firms organized and operated according to his ideas would be at least as efficient as conventional firms. While he favors a socialistic form of economic organization, he would undoubtedly argue that industrial democracy would benefit any indus-

trial society, regardless of its institutional framework.

He does not, however, seem to have based his contentions on a serious appraisal of the theoretical and practical problems of implementing his system in any economy but one of his own making. The conflicts between such an innovation and the institutional arrangements which have evolved in a free enterprise economy might be so great that industrial democracy would be either impossible to attain or not worth the price.

What, for instance, would be the effect of industrial democracy on the nature and functioning of labor unions? Unions in the United States would most likely oppose the participation of their members in policy formulation because of the debilitating effect on the union's position of an industrial partnership between management and labor. Without the support of union officials, industrial democracy could be achieved only if the rank-and-file members forced the issue, and this is not likely to occur except under unusual circumstances. It is difficult to imagine a set of circumstances which would lead rank-and-file workers to become vitally concerned with business policies other than those which affect them most directly (e.g., wage rates, working conditions, stability of employment).

Labor unions are already active in influencing these kinds of policies, but if they became the vehicle for worker participation in production, financial, and marketing policies and decision-making, they would be forced to deal with all of the factors influencing firm behavior. They could not restrict their influence to labor policies and decisions, as they do at present. It is doubtful that union representatives could help manage firms and remain completely loyal to the workers' interests at the same time.

Unfortunately, the functions and methods of management are dealt with only tangentially in Cole's book. He recognizes the impractical-

⁵ Edward S. Mason in a recent article "The Apologetics of 'Managerialism'" XXXI, 1, *The Journal of Business* (January, 1958), and other writers have suggested that profit maximization and consumer sovereignty are probably not so effective in regulating economic activity as is usually supposed.

ity of electing the top management personnel of firms; instead, he would limit their authority in policy formulation and in the selection of supervisory personnel. He writes:

Obviously (industrial managers) are indispensable and must be in a position to issue orders with the expectation that these orders will usually be obeyed. This is not in question . . . the question is under whose auspices and final control the orders are to be issued and who has the right to dispute them when they are wrong.⁶

This raises questions about the external and internal operating efficiency of the firm. Assuming workers are interested in participating in policy formulation, are they able to make wise decisions? If so, can the resulting policies be effectively implemented? Cole intimates that workers will only decide on issues that affect them personally, such as technological innovations which may displace them. But what major policy decisions of a firm do not affect workers? A decision to change product design made today can determine the ability of the firm to grant a wage increase one year hence. What criteria could be adopted to distinguish between policy issues in which the workers should and should not participate?

It is questionable that the authority relationships which presently exist between workers, supervisors, and top management would be compatible with a policy of industrial democracy. The concept of authority as defined by Tannenbaum is "... an interpersonal relationship in which one individual, the subordinate, accepts a decision made by another individual, the superior, permitting that decision directly to affect his behavior."⁷ It is the function of supervisory management to make decisions which influence the behavior of subordinates through the exercise of authority. But how effectively can this function be carried out if the apparent as well as the real source of authority of a supervisor is derived from

his subordinates? Would a supervisor chosen by his subordinates be inhibited in the proper performance of his duties by the fear that unpopular orders would not be carried out or that he would be removed if his subordinates disagreed with his decisions?⁸

Another problem concerns the kind of arrangement that could be developed to negotiate policy differences between management and workers. It seems inevitable that the somewhat ponderous machinery currently used for wage bargaining would be a prototype for such arrangement. If so, management would lose much of the flexibility needed for rapid adaptation of business policies to changing conditions. A decision to cut back production would be as major a bargaining issue as the wage rate is currently.

My purpose is not to catalogue completely all the possible ramifications of introducing a system of industrial democracy into a free enterprise economy, but merely to suggest that it is questionable, to say the least, that such an innovation could be accommodated within the free enterprise institutional framework without serious displacement of important and long-standing industrial relationships.

An examination of two industrial situations which closely approximate industrial democracy should show whether this questioning is justified by experience.

THE WORKER-OWNED PLYWOOD MILL MOVEMENT⁹

Approximately one-fourth of the output of the Pacific coast softwood plywood industry is produced by firms which are owned by the men who work in the mills. These firms are

⁶ Chester I. Barnard has written, "There is no principle of executive conduct better established in good organizations than that orders will not be issued that cannot or will not be obeyed." *The Functions of the Executive* (Cambridge: Harvard University Press, 1938), p. 167.

⁹ Most of the data in this section were collected by the author in personal interviews in connection with an extended study of the economics of the softwood plywood industry.

⁶ Cole, pp. 12-13.

⁷ Robert Tannenbaum, "Managerial Decision-Making," *The Journal of Business*, XXIII, 1 (January, 1950), 27.

called "co-ops" in the industry, but they are neither marketing nor producing cooperatives. They are profit-making organizations incorporated under state incorporation laws, and they pay federal and state taxes and receive the same treatment as any other corporation.

The worker-owned mill movement began in 1921 when the Olympia Veneer Company was organized at Olympia, Washington. One hundred and ten men subscribed \$1,000 each and a plywood plant was built. The firm struggled for survival for a number of years, but it became prosperous when the demand for plywood expanded. The original shareholders who worked in the plant received a base wage of \$3.50 per hour and all shareholders received substantial dividends (they averaged seven thousand dollars per year for the period 1949-1954). In 1954 the firm was sold for \$15,000,000 and each surviving shareholder received \$217,000.

The success of this venture led to the formation of more than twenty additional worker-owned mills. One to three hundred men subscribe between \$2,000 and \$10,000 each for a share in these corporations. Each worker-owner is limited to a single share of stock which carries with it one vote in shareholder meetings and the right to a job in the mill. If shares sell for \$5,000 and the full amount is paid in, this makes an original capital fund of \$500,000 to \$1,500,000. This is sufficient to buy an existing mill¹⁰ or build a new one and to buy machinery.

The AFL and CIO unions representing plywood workers have been bitter opponents of the worker-owned mill movement. When a worker-owned plant draws its members from union workers and they let their union membership lapse the union is harmed in three

ways: it loses membership and dues; its strike threat is weakened somewhat since worker-owned mills can continue to supply the distribution pipelines;¹¹ and the union's bargaining position is weakened because of the employer use of the threat to "go co-op" as a tactical weapon in negotiations.

The internal organization of worker-owned mills generally reflects a mixture of industrial democracy and business expediency. Since every man has an equal ownership interest in the corporation, leadership tends to be diffused. Cliques spring up and it is not uncommon for a shareholders' meeting to end in a "free-for-all."

The firms are managed by management committees elected annually by the shareholders. The turnover of the membership of these committees tends to be high. This has the advantage of giving a large number of shareholders management experience, but it results in discontinuity of management policies.

The shareholders of each firm elect a president or general manager each year. In new mills these elections tend to be popularity contests and there is no assurance that the men elected have the necessary ability to manage the firms. The tenure of office of managers tends to be rather short in newly organized firms because crises are common in the first few years of corporate existence. Shareholders are frequently unable to appreciate the complexity of the management task, and they expect managers to solve immediately serious financial, production, or marketing problems.

Worker-owned mills which survive the contingencies of the early organizational period tend to adapt conventional business procedures to their own peculiar problems. They hire outside men without ownership interest in the corporations to manage them under the supervision of the management committees. Presidents may still be elected but they are usually figure-

¹⁰ Some established plywood firms sell their mills to their employees to avoid labor disputes, but they retain the timber holdings and obtain an exclusive sales contract for the plant's output. In a few cases mills have been sold to employees to prevent a forced liquidation after the death of the owner to pay inheritance taxes.

¹¹ During the strike in 1954 the worker-owner mills were able to produce 51 per cent of the industry's normal output, double their usual contribution.

heads. These firms sometimes bring in outside plant superintendents, log buyers, and sales managers, because these are key jobs which require skill and experience. Other jobs in the plant are filled on the basis of the shareholders' skills, experience, abilities, and job preferences. In some firms the shareholders rotate the various jobs and work shifts. In the event that there are more jobs than shareholders, an attempt is made to sell additional shares; if this is not possible, union workers are hired.

Workers join worker-owned corporations for several reasons. These firms have no mandatory retirement age, so older workers who buy shares are assured of jobs at an age when they might otherwise have difficulty in securing employment. Some workers are attracted to these firms because of the spectacular earnings made by shareholders in some of the earlier worker-owned mills. The most important incentive, however, for joining a worker-owned corporation is the higher-than-average wage a shareholder can earn. In 1955 union wages in the industry averaged \$2.09 per hour, but a shareholder in a prosperous worker-owned mill could earn as much as \$3.50 per hour.¹² For an average year's work this meant a return on a \$5,000 investment (the average in the industry) of about \$2,933 or 58.6 per cent per annum.

The worker-owned mills have been able to compete effectively in the softwood plywood industry because of their high rates of productivity and their ability to cut prices in a softening market. Although no data are available on the productivity differential between worker-owned mills and other firms, worker-owned mills are generally acknowledged to be able to

produce about 15 to 20 per cent more than other firms with comparable plant and equipment. The worker-owned mills attribute this to the greater effort made by men who work for themselves.

The feeling of ownership is undoubtedly important, but it does not explain the entire differential in productivity. The worker-owned mills have tended to emphasize production volume at the expense of quality of output. Thus their production and man-hour productivity are high, but they get a lower net return from logs consumed than other firms. Some observers think that the high productivity of worker-owned mills is due in part to the fact that they use logs purchased on the open market. Mills using logs coming from their own timberland tend to use poorer quality logs on the average than mills which purchase all of their logs on the open market.

The worker-owned mills are often the price leaders in a downward direction. In a soft market these firms prefer to accept a lower price rather than cut back production. Since labor represents a fixed rather than a variable cost for these firms (ownership of a working share guarantees a job), their prices can be cut substantially and still exceed variable costs of production. Consequently, the necessary supply adjustment is forced on other firms which hire labor at union rates and have higher variable costs.

CODETERMINATION IN WEST GERMANY

An experiment in the joint control of industry by labor and management, which is called *Mitbestimmung* or codetermination, has been under way in West Germany since 1947. This system was introduced with the permission of the Allied occupying forces, and later it was implemented by national legislation. The purpose of codetermination is to share between representatives of owners and labor the management responsibilities of the firm. In theory,

¹² In some cases, however, the \$3.50 hourly rate was only a nominal figure. Some mills, especially the newer ones which were short of working capital, paid the \$3.50 rate and then assessed their shareholders or borrowed part of it back to purchase logs or standing timber. Non-worker-owned mills objected to this strenuously, claiming that since the returns to the workers were taxed only as personal income and not as corporate income this gave the worker-owned mills a competitive advantage in securing working capital.

management is no longer allowed unilateral control over the affairs of the company. Labor has an equal voice in policy formulation and decision-making powers relating to production, marketing, finance, labor relations, and all other important matters concerning the firm.

This movement has deep roots in German economic history, and it is the culmination of over a century of controversy over workers' rights. R. H. Bowen says that since modern industrialism began to appear in Germany, worker participation in management was seen as "an alternative to contemporary tendencies that seemed to lead inescapably toward social upheaval, economic instability, political injustice, and national dissolution."¹³

The powerful German Federation of Trade Unions (*Deutscher Gewerkschaftsbund*) has been strongly identified from the start with the codetermination movement. It sees in codetermination a vehicle for affecting major changes in German social and economic life. According to Abraham Shuchman, the German trade unions came out from cover after World War II with the belief that "labor's goals, identified with those of the nation, are attainable only if democratic principles are applied in other areas of life, particularly the industrial and economic."¹⁴ A statement in a publication of the German Federation of Trade Unions indicates the wide scope of the codetermination movement:

The union's demand for the codetermination of labor and its organization is the logical supplementation of our political democracy. We may not again construct a state in which our public life is organized in accord with democratic principles while the economic organization remains fastened in enlightened absolutism . . . The DGB (German Federations of Trade Unions) demands, therefore, a continuation of the start once made toward a really democratic organization of our economy.¹⁵

¹³ R. H. Bowen, *German Theories of the Corporate State* (New York: McGraw-Hill, 1947), p. 211.

¹⁴ Abraham Shuchman, *Codetermination: Labor's Middle Way in Germany* (Washington, D.C.: Public Affairs Press, 1957), p. 2.

¹⁵ German Federation of Trade Unions, *Proposal for a Law Concerning the Reorganization of the German Economy* (Duesseldorf: May 22, 1950). Quoted in Shuchman.

Worker participation in management in a system of codetermination can occur at the level of the enterprise and at the level of the economy. At the enterprise level workers participate in three areas: personnel, social, and economic. Social decisions concern health and welfare programs administered within the firm, and decisions within the economic sphere relate to technical matters of production planning and control and to such "business" matters as marketing, finance, and distribution of profits. Decisions at the supra-enterprise level are those usually made by political agencies, but they are analogous in content to decision areas at the enterprise level.

The Codetermination Law, passed in April, 1951, and the Plant Organization Law, passed in July, 1952, implement worker participation in management at the enterprise level in the private sector of the economy. The Codetermination Law, which is the most far-reaching of the two, applies only to certain large firms in the mining and iron and steel industries. It provides for election to the supervisory board, which corresponds to our board of directors, of an equal number (usually five) of representatives of labor and shareholders and one neutral member. In German firms there is below the supervisory board a management board, which is made up of a "commercial director" and a "technical director" who are not members of the supervisory board but who actually run the firm. The law requires that a labor director be added to the board who represents labor's interests and who has equal standing with the other directors.

The Plant Organization Law provides for worker participation in management through employee works councils. These councils, elected by the workers, meet with the employers monthly to settle issues in dispute. They also negotiate a plant agreement with the employers, supervise the execution of labor laws and union contracts, and they have other welfare and personnel prerogatives as well. The council, however, is not authorized to interfere

in the management of the plant, and it has only the right of consultation in matters of economic policy.

When these laws were passed, they were commonly considered to be the most progressive labor legislation in the world, and it was predicted that they would have a profound effect on labor-management relations. However, according to W. Michael Blumenthal, who has followed the experience of codetermination in the steel industry, whatever other effects the program may have had, "the evidence is clear that management did not lose its prerogatives under codetermination."¹⁶

Each group sought to achieve traditional goals; labor representatives concentrated on wages and working conditions and management retained its control over other matters. Each was able to achieve its major objectives by a kind of logrolling arrangement, which resulted in a process of dividing rather than sharing decision-making powers. The necessity to avoid controversial issues and to negotiate at length, which were the outcome of this approach, slowed down the decision-making process considerably. Blumenthal concludes that the division of responsibility in decision-making developed because it was essential to make the unwieldy codetermination machinery operational and because the labor representatives continued to identify themselves with the lot of the workforce rather than with management.

According to Blumenthal, there is no indication that codetermination increased productive efficiency, but there is evidence that it led to higher labor costs in the steel industry. This would suggest that the labor representatives used their power to attain the same goals that they would in any other labor-management relationship.

¹⁶ W. Michael Blumenthal, *Codetermination in the German Steel Industry*, Research Report Series No. 94 (Industrial Relations Section, Department of Economics and Sociology, Princeton University, 1956), p. 110.

CONCLUSIONS

The worker-owned plywood mill movement and the system of codetermination are valid case materials for the question we have raised—the feasibility of introducing industrial democracy into a free enterprise economy. They both contain the essential element of the participation of workers in the management of firms in free enterprise systems.

Aside from this similarity, the differences between the two movements are striking. The background of the codetermination experiment is almost a classic example of the conditions which would seem to be most favorable for the emergence of industrial democracy: a large and well demarcated group of workers, a history of controversy over labor's rights, longstanding resentment of the unilateral authority of management, an aggressive and well-established labor union organization, the active support of government, and a favorable atmosphere of public opinion. On the other hand, the form of industrial democracy which characterizes the worker-owned plywood mills came into being simultaneously with the existence of these firms. Instead of industrial democracy being a consciously striven for goal, it was a fortuitous circumstance thrust upon the workers almost in spite of themselves.

These differences in background are important for our purposes because they give us two complementary views of the problems of implementing industrial democracy into a free enterprise economy. In the codetermination case we see the problem of fitting this innovation into an industrial situation containing all of the institutional arrangements which characterize mature labor-management relationships. In the plywood case, we can observe industrial democracy free from previous institutional relationships.

On the whole, industrial democracy was not notably successful in achieving the objectives which its proponents promise in these situations, for different reasons in each case.

The codetermination experiment gives substance to a question posed earlier: how can industrial democracy be made to work in industries in which there is a strong labor union? This question is paradoxical in a sense, because it would seem that the chances for industrial democracy to function effectively would be best when it is supported by a well-established and aggressive union organization. It is difficult to imagine a more favorable set of circumstances for the introduction of industrial democracy into this kind of setting than that which existed in the postwar West German steel industry.

The very strength of the union, however, acted as a deterrent to industrial democracy. The rank-and-file workers were given in theory a share in the control of the firms in which they worked, but as we have seen this had no significant effect on management prerogatives. The reason for this was that the power to participate in management was won by "labor" rather than rank-and-file workers. It could not be otherwise in such an industrial setting. It was necessary to delegate the actual implementation of industrial democracy to a small number of men. But the labor representatives on the management boards thought, apparently, that they had to choose between alternative courses of action that permitted no compromise. They could have participated fully in the management of the firm or they could have followed their proclivities and watched over the interests of the workers. They wisely chose the latter course. Any intermediate approach would have placed them in the difficult position of trying to maximize the welfare of more than one group at the same time. Although the economic interests of owners, managers, and workers certainly are interrelated and may even be parallel in the long run, they are also sometimes in conflict in day-to-day situations; decisions on such issues can not be made in good conscience by men serving more than one master.

The codetermination experience suggests this hypothesis: in large scale industries in which there is a strong trade union organization any program to attain industrial democracy will be subordinate to the more traditional aspects of labor-management relations. For industrial democracy ever to become a vital factor in such an industry, it would be necessary to develop a set of institutional relationships which permit the union to operate effectively in a dual responsibility, and such a development seems highly unlikely.

Industrial democracy in the worker-owned plywood mill movement does not have the theoretical background that it has in the system of codetermination, but it offers a better example of the mechanics of multiple management. There is no necessity for a delegation of the workers' share of policy formation and decision-making because of the relatively small number of workers in the firm and the complete identity of owner, manager, and worker. In such a situation worker participation in management could be carried to great lengths, the only significant limitations being the motivation of the workers and the effect on the efficiency of the firm.

The most outstanding characteristic of this movement for our purposes is that the workers banded together for economic rather than status reasons. They participated in management to the extent necessary to safeguard their economic interests. As we have seen, at first there was fairly active participation by workers in management, but when the mills became successful there was a tendency to bring in skilled executives with no ownership interest. This suggests that a centralization in decision-making was essential for efficient operations. When it became evident that the efficiency of the firm could be increased by adopting a more orthodox labor-management relationship, these firms showed no hesitation in making the change. Worker productivity was high in these firms, but this was probably more due to the

recognition by the workers that their income depended directly on their own efforts rather than because of their participation in management and the selection of their superiors. This was an incentive similar to that offered by piece-work payment.

This experience indicates that industrial democracy is not likely to be highly valued by workers unless they have had a history of resentment toward management's prerogatives and have gained a voice in management at some cost to themselves. Furthermore, in this case we see a reduction in operating efficiency of the firm because of the breakdown of traditional authority relationships.

In conclusion, it appears that these case materials substantiate our concern about the consequences of introducing a valid system of industrial democracy into a free enterprise economy. On the one hand, the cost seems to be excessive—perhaps the scrapping of the collective bargaining system, which has been nurtured so slowly and at such a great cost. On the other hand, there is little indication that a system of industrial democracy is the only way or

the best way to bring about a change in the status of workers. The relative disinterestedness in industrial democracy of the worker-owners in the plywood industry as compared to the German steel workers is instructive. As Blumenthal writes:

...codetermination is a peculiar German phenomenon which developed only because of a peculiar historical and environmental setting... the incentive to institute codetermination (in the United States) is lacking, for it accomplishes nothing that cannot be gained under free collective bargaining.¹⁷

Perhaps the lesson to be learned by the contrast between the worker-owned plywood mill movement and the codetermination experiment is that it is the whole fabric of a society's economic institutions and social mores which determines the level of the socio-economic status of workers. If it is desirable to elevate this status, an attempt to do so by introducing into labor-management relations an innovation such as industrial democracy without carefully appraising its over-all impact seems shortsighted.

¹⁷ Blumenthal, p. 114.

The question "Who ought to be boss?" is like asking "Who ought to be the tenor in the quartet?" Obviously, the man who can sing tenor.

Henry Ford

Regional Business Forecasting

This article discusses ways and means of preparing regional business forecasts. First, a forecast of the business outlook for Los Angeles in 1959 is presented to illustrate some possible procedures in forecasting. Then a more general discussion of forecasting procedures is offered together with some observations on how business management can make use of such regional projections.

BUSINESS OUTLOOK FOR LOS ANGELES IN 1959

We may expect employment in Los Angeles in 1959 to rise by about 100,000, or 4%, over 1958. Personal income and retail sales should be up about 8%. These are the conclusions from my analysis of the expected behavior of three factors which are strategic to business activity in Los Angeles. These are:

1. Trends in the national economy.
2. Construction activity in the Los Angeles area.
3. Defense spending in the Los Angeles area.

The choice of these three key factors is the result of a comprehensive study which sought to isolate the prime causal factors.¹ This study shows that employment in Los Angeles has

¹ During the summer of 1958 the author received a research grant from the Division of Research in the Graduate School of Business Administration at UCLA to develop procedures for forecasting regional business trends. Los Angeles was selected as a model. I believe that the principles for forecasting Los Angeles business conditions are applicable to most metropolitan areas of the U. S.

closely paralleled national nonfarm employment, except for some small deviations in the years 1952 and 1957. During 1952, defense spending increased sharply while national civilian spending remained relatively stable. Since a significant part of the defense spending occurred in the Los Angeles area, its employment as a per cent of the national rose more than usual. In early 1957, on the other hand, the Department of Defense curtailed its expenditures for the procurement of aircraft; as a result, the Los Angeles share of national employment increased by less than the usual amount.

Construction employment in Los Angeles represents 5.4% of total employment, but nationally it is only 4.3%. More important is the fact that Los Angeles construction has shown some sharp shifts and has at times (1957 for example) moved counter to national trends. Thus the pattern of Los Angeles economic conditions can be explained by the fluctuations in the national economy, defense spending and local construction activity. These three factors are of course not wholly independent of one another, but each is sufficiently independent to warrant separate analysis.

Before the local forecast could be made, therefore, it was necessary (a) to project the national economy (including Gross National Product) through 1959, (b) to analyze the advance indicators and factors in the local construction market and, (c) to consult with the important local defense contractors to ascertain

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their probable employment rates in 1959 and analyze the budgeted expenditures of the Department of Defense. A resume of findings about these elements of the forecast follows.

Major Trends in the National Economy

Some conclusions about the probable trends in spending by business, government, and consumers were necessary to estimate the probable trend of the national economy through 1959. The aggregate expenditures of business, government, and consumers make up Gross National Product—a valuable indicator of the over-all level of economic activity. The analysis of these three factors (which follows) lead to an estimate of Gross National Product (GNP) for 1959 of between \$460 and \$470 billions, or 5% to 8% higher than for 1958.

Business Spending. Construction contracts awarded and housing-starts exhibited an upward trend by mid-1958 which continued through the end of the year. This trend got under way in part because there was a greater availability of mortgage money by mid-year, while vacancy rates for rental residential units remained relatively low. From 1957 through June 1958 private-housing-starts averaged below one million units on a seasonally adjusted annual-rate basis. If we allow for the number of units taken off the market in this period because slum clearance, fire, storm, flood, road and industrial construction, physical deterioration, etc., this rate of housing-starts probably was less than the net increase in the number of nonfarm families. Thus, a deficit in the housing supply, relative to population and income changes, probably developed in this period.

This condition, along with increased availability of mortgage money, should result in greater construction expenditures in 1959 than 1958. Expenditures on plant and equipment were relatively low in 1958 and some increase is likely in 1959 as profits improve and business operates at a higher percentage of capacity. This conclusion is supported by the survey

of planned capital outlays for 1959 published in *Business Week* (Nov. 8, 1959). Higher capital outlays of this type should prove a stimulus to both the construction and machinery industries.

During 1958, over-all production in the United States ran well below the rate of consumption, causing inventories to decline by about \$6 billions. This imbalance was, of course, only temporary. With numerous factors combining to stimulate a higher rate of consumption of goods and services this year, production will have to run significantly higher than in 1958 (a) to prevent further liquidation of inventory and (b) to restore a ratio of inventory to sales that will enable the typical firm to have a strong competitive sales position. The higher rate of production will lead to a rate of inventory investment this year that will be significantly higher than in 1958, but lower than that of 1955 and 1956.

Government Spending. The federal budget for fiscal 1959 and the tentative budget for 1960 indicate purchases of goods and services will be about \$1 billion higher in 1959 than in 1958. Spending by state and local governments has risen at a remarkably steady rate of \$2 to \$3 billions each year since the end of World War II. On the basis of budgeted outlays, construction contracts awarded for public projects, and other considerations, it is expected that this trend will continue in 1959.

Consumer Spending. The expected increases in construction expenditures, business outlays on plant, equipment, and inventory, and government spending will lead to higher incomes for consumers. Also, wage and salary rates can be expected to continue their upward trend in 1959. Besides higher incomes, consumers will probably utilize more installment credit in 1959. In the past, higher consumer incomes have been accompanied by higher rates of borrowing. In 1958, however, consumers cut their rate of borrowing and reduced this type of

indebtedness by about \$500 millions during 1958. Borrowing in 1959 will probably rise more than the rate of debt repayment, and this will add to the volume of consumer expenditures.

Summary of National Trends. These expected increases in expenditures by the three major economic groups in 1959 total about \$25 to \$35 billions, or from 5% to 8%. (The economic recovery of 1955 over 1954 was 9.5%.)

As aggregate expenditures rise, an initial reaction by producers operating on a short work week (as in 1958) is to return to a normal work week. If this is not enough to handle the increase in demand, employment is likely to be increased. More or less continuous gains in productivity are generally obtainable, and this also contributes to greater output. Because labor costs tend to rise faster than productivity, it has been common to find some price increases which absorb part of the increase in spending. Therefore, the 5% to 8% rise in aggregate expenditures in 1959 is expected to be accompanied by the following changes:

1. The length of the work week will be up by 1% to 2%. The work week was relatively short in 1958, and an increase in activity can therefore be expected to lead to a longer work week.

2. The rise in spending will of course lead to higher production and employment. Non-farm employment is expected to be 2% higher, and in the latter part of 1958 such a trend was well under way.

3. Output per man-hour may rise by about 3% to 4%. This is fairly common during periods of economic recovery, and during the latter part of 1958 over-all output of goods and services was rising significantly faster than employment.

4. Prices will average 1% to 2% higher. Wage and salary rates have been rising faster than productivity, an imbalance likely to con-

tinue, although by a smaller margin. This imbalance tends to produce higher prices.

The foregoing is only a summary of how GNP was forecast; much detail has been omitted. Other methods could have been used, such as the building of a mathematical model, leading statistical indicators, and surveys of businessmen and consumer expectations. The method employed here, however, is the one preferred by the author.

Effect on Los Angeles. The aspect of this analysis of GNP that is most pertinent here is the anticipated 2% increase in national non-farm employment. This increase in employment is significant because of the striking correlation between employment in the whole United States and that of Los Angeles. (See Table 1.) If the future relationship continues as in the past, and there is no reason to consider that 1959 will break this pattern, a projection of U. S. employment leads easily to a forecast of Los Angeles employment.

Table 1 shows that employment in Los Angeles, as a percentage of national, has grown fairly steadily. The prime factor in this rise is probably the climate of Southern California, which has attracted a growing share of the nation's population. Moreover, many firms choose to locate in Los Angeles because it is often easier to attract employees into this area than into some others. Since the climate is going to continue to be relatively more attractive, it is likely that the area will continue to account for a growing percentage of the population and employment in 1959.

In 1959, therefore, if national employment increases by 2%, or 1,000,000, and the Los Angeles share of national employment increases by .09% (Table 1), then employment in Los Angeles should increase by 100,000 or 4% during 1959.

With the expected 4% increase in employment, along with the steady upward trend in wage and salary rates, higher levels in personal income and retail sales are likely. Wage and

TABLE 1
TRENDS IN LOS ANGELES EMPLOYMENT RELATIVE TO THE NATIONAL

	Employment in Los Angeles	Non-Agricultural Employment in the U. S.	Los Angeles Employment as per cent of U. S.
	(millions)	(millions)	
1949.....	1.70	43.3	3.92%
1950.....	1.77	44.7	3.95%
1951.....	1.91	47.3	4.04%
1952.....	2.04	48.3	4.23%
1953.....	2.16	49.7	4.34%
1954.....	2.18	48.4	4.50%
1955.....	2.32	50.1	4.64%
1956.....	2.45	51.8	4.73%
1957.....	2.52	52.2	4.80%
1958.....	2.49	50.6	4.91%
1959 (estimate).....	2.59	51.6	5.00%

salary rates have been rising at about 4%, both nationally and locally, a rate we may expect to continue. Together then, these two increases should raise personal income in Los Angeles by about 8% in 1959. Retail sales also are likely to continue moving upward with personal income; they should also increase by about 8%.

Table 2 summarizes the actual figures of Los Angeles employment, personal income, and retail sales for 1959 and the expected results for 1958 and 1959. Since data are already available on Los Angeles employment through the first eleven months of 1958, the estimate for the year is probably accurate.

Chart 1 shows the past and projected trends in the ratio of Los Angeles employment, personal income, and retail sales to those of the over-all U. S. For example, Los Angeles em-

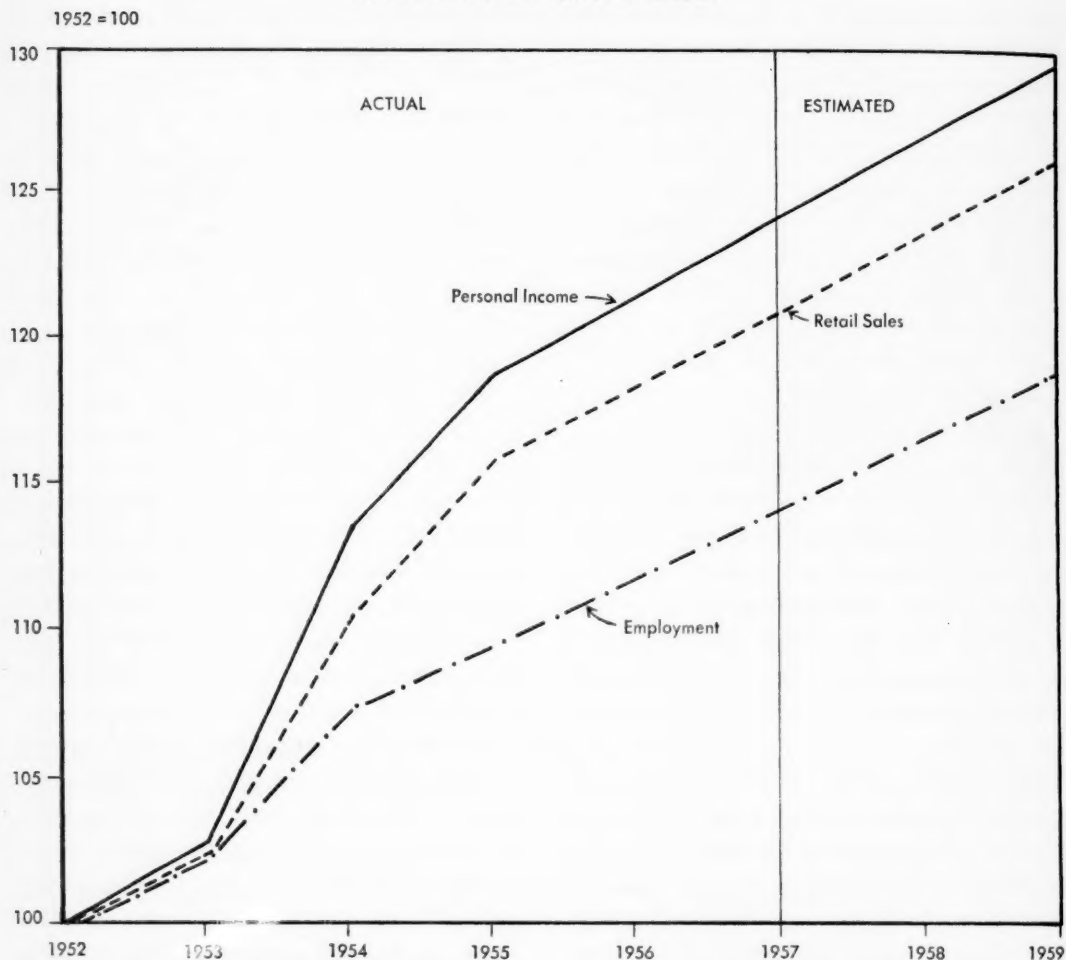
ployment as a per cent of national rose from 4.23% in 1952 to 4.80% in 1957. The latter ratio is 13.5% above the former and therefore on the chart the trend line for employment shows a 13.5% increase from 1952 to 1957. From this chart it can be seen that the projections for 1959 are in line with past trends.

In brief, then, the foregoing analysis derived an estimate of the level of employment and of personal income and retail sales on the basis of the correlation of economic activity in Los Angeles with the probable trends in the national economy. But it still remains to be shown whether the past relationship between the national and Los Angeles economies is likely to maintain during 1959, or whether exceptional circumstances are likely to arise during the year, as they did in 1952 and 1957, to upset this relationship. The next step, there-

TABLE 2
TRENDS IN LOS ANGELES EMPLOYMENT, PERSONAL INCOME, AND RETAIL SALES

	Employment		Personal Income		Retail Sales	
	(in 000,000's)	Per cent Change from Previous Year	(in 000,000's)	Per cent Change from Previous Year	(in 000,000's)	Per cent Change from Previous Year
1957.....	2.52	.....	\$15,982	.....	\$ 9,121	.....
1958 (estimate).....	2.48	-1.5%	16,400	+2.5%	9,350	+2.5%
1959 (estimate).....	2.58	+4.0%	17,700	+8.0%	10,100	+8.0%

CHART 1
RATIO OF LOS ANGELES EMPLOYMENT, PERSONAL INCOME, AND RETAIL SALES TO
COMPARABLE SERIES FOR OVER-ALL U.S.



fore, is to analyze the outlook for construction activity and defense spending in Los Angeles.

Construction Activity

The trend in building permits issued in Los Angeles from mid-1957 through the end of 1958 was steadily upward. Permits in the past have proved to be a fairly reliable indicator of future short-run construction activity. However, to estimate with any validity whether construction activity will continue to rise for a period as long as twelve months requires consideration of such factors as:

1. The availability, cost, and terms of mortgage money.

2. General trends in employment and income in the area.

3. Vacancy rates that prevail for residential, industrial, and commercial buildings.

It should be noted that local construction is being forecast to assist in the forecast of over-all business conditions in Los Angeles. At the same time, however, the volume of construction activity will be influenced by the relative strength of over-all business conditions in Los Angeles. Therefore, in order to avoid traps in circular reasoning, it is necessary to give special consideration to those factors influencing construction other than general economic activity in the local area.

Current indications are that the availability of mortgage money will become more restricted as 1959 moves on. The mortgage money coming into Los Angeles which resulted from steps taken by the U. S. Congress in 1958 will probably be pretty well used up by mid-1959.² Also, since the economy is expected to be operating at a higher level by mid-1959, it is quite possible the monetary authorities will place more curbs on the availability of credit than they did in 1958 when more economic resources were idle. This could have some adverse effect on decisions of builders to launch projects.

Vacancy rates in Los Angeles for many types of buildings have been rising for the past several years. This is likely to provide some discouragement to construction activity even though these rates are not yet unduly high.

In summary, construction activity is likely to rise during the early part of 1959, then level off. Thus, this industry is expected to exert only a modest expansionary influence on the economy of Los Angeles in 1959.

Defense Spending

The largest industry in Los Angeles in terms of employment is aircraft manufacturing; aircraft workers account for about 7% of total employment. In forecasting business conditions in Los Angeles, therefore, it is highly desirable to obtain the best possible estimate of employment trends in this industry through 1959. Military manned aircraft account for almost 80% of the total dollar volume of aircraft production. Military expenditures for manned aircraft are expected to decline by about 10% in 1959. These estimates are based on (a) budgeted expenditures by the Department of Defense for fiscal years 1959 and 1960 and (b) expectations of the large aircraft manu-

facturers. Production of passenger and cargo planes for airlines will show some increase, but not enough to offset the decline in military aircraft.

Military electronics is another important source of employment in Los Angeles. The expenditures on this type of product are expected to rise somewhat more than military aircraft expenditures are likely to decline, according to the important defense contractors. Consequently, over-all defense spending in the Los Angeles area is likely to show a small increase in 1959, relative to 1958.

There are, of course, many important manufacturing industries in Los Angeles other than aircraft and electronics. But data on month-to-month employment trends in each of these industries is lacking. Therefore, except for the construction and aircraft industries, projection of employment trends in Los Angeles must be based largely on trends of the national economy.

Summary

It has been shown that Los Angeles tends to follow the national trends in economic activity, except when there are strong contrary trends in local construction and/or defense activity. Since no such contrary trends appear likely for 1959, Los Angeles employment should continue to rise as a per cent of national, moving from 4.9% in 1958 to 5.0% in 1959.³

PROCEDURES

In other studies, the author has analyzed

³ It was not practicable to develop what might be termed "gross Los Angeles product," similar in concept to gross national product. An estimate of gross L. A. product would be the aggregate of expenditures by consumers, business and government in the area. However, data on these types of expenditures are not available on an area basis. It might be assumed that L. A.'s gross product represents about the same per cent of gross national product that its employment is of national employment. Some upward adjustment might be made for the fact that consumer spending per employed person is somewhat above the national average, because local wage rates are above the national average.

² The Emergency Housing Act of 1958 provided substantially more funds to the Federal National Mortgage Association to purchase certain types of home mortgages. This made it easier for home buyers to obtain mortgage credit.

the problems involved in forecasting Los Angeles' business conditions and numerous other areas.⁴ It was concluded in this study that at least one way of preparing a regional forecast consists of carrying out the following three steps: (1) forecasting national business conditions and estimating the probable impact on the region under study, (2) analyzing the regional business statistics which have predictive value, and (3) obtaining from the large employers in the area whose level of activity is relatively volatile their projected employment pattern. This is the methodology used above. Particular attention is paid to employment in this procedure, because fluctuations in personal income and retail sales are strongly dependent on movements in employment. Also, monthly data on employment are available in many regions, whereas monthly data on over-all production, personal income, and retail sales are not.

Prior to the actual preparation of the regional forecast, a determination must be made of the particular region for which a forecast is desired. Regional business statistics on employment, construction activity, and retail sales are usually available on the basis of counties, metropolitan areas, and states. Sometimes such data are not available for the precise area being studied; in these instances, the forecaster may legitimately use data for an area which is slightly different but which is still generally comparable. For example, the area of concern may be a large city which covers a full county and spills over into another. Data may be available only on the county where the city is primarily located, but it can often be assumed that the trends for

this county accurately reflect the pattern for the metropolitan area.

In many regions the pattern of employment is quite similar to that of the national economy. This is because many regions sell an important part of their output to the other areas of the country; thus such regions are strongly dependent on the vigor of the over-all economy. Also, certain basic economic conditions may prevail in many regions of the county simultaneously, so that any one region may have the same business-fluctuation pattern as the nation. These basic economic conditions may be the result of the monetary and fiscal policies of the government, wage patterns, broadly-based research programs, etc.

Where the regional pattern follows the national, accurate forecasts of the latter may provide reasonably accurate estimates of the likely pattern for the former. Whether a given region closely follows the national pattern can be determined by charting employment for that region and comparing it with the national monthly fluctuations in employment (both adjusted to remove seasonal influences).

It is also often useful to plot regional employment as a per cent of national (both seasonally adjusted) by months, over a long period of time, to see if there is not some steady relationship. Sometimes this percentage tends to rise or fall slowly but steadily. It may be possible to project such trends with some accuracy if the factors responsible for the past trends are likely to continue to be operative to about the same degree.

Business statistics with predictive value are more readily available for national economic conditions than for regional. Because of the usual scarcity of regional data that is helpful in forecasting, it is often necessary to assume that, for the most part, regional conditions will be some function of the national pattern. Insofar as available local data indicate deviation from this relationship, the forecast obtained by assuming the regional trend to be a

⁴During 1954 and 1955, as Manager of the Economic Research Department of the Ford Division of the Ford Motor Company, I was responsible for the development of procedures for forecasting business conditions in each of the company's 33 sales districts, which of course covered all of the United States. Forecasts were made of personal income, farm income, manufacturing employment, construction activity and retail sales for each sales district.

function of the national trends can be modified, and the accuracy of the regional forecast can be improved.

Listed below are some of the statistical series (and their sources) that have predictive value, but which are usually available only on a national basis: (Note: Letters in parentheses indicate source of data. The keys to these letters are listed below.)

1. New orders for manufactured goods (A, B).
2. Unfilled orders for manufactured goods (A).
3. Business inventories and sales (A, B).
4. Projected federal budgets (B, D).
5. Planned outlays on plant and equipment (A, B, D).
6. Funds appropriated by business corporations for capital outlays (also backlogs of funds appropriated but unspent) (E).
7. New orders and backlogs of orders for machine tools (A).
8. McGraw-Hill series on machinery orders (D).
9. Consumer installment debt outstanding, new loans, and repayments (C).
10. Surveys of consumer optimism and spending intentions regarding durable goods (C, D).

SOURCES:

- A. *Survey of Current Business* (U. S. Department of Commerce)
- B. *Economic Indicators* (Council of Economic Advisors)
- C. *Federal Reserve Bulletin* (Federal Reserve Board)
- D. *Business Week* (McGraw-Hill Publishing Co.)
- E. *Newsweek*

Of those regional business statistics which do have predictive value, most pertain to the construction industry. Following are major examples:

1. Building permits issued (local building authorities).
2. Construction contracts awarded (F. W. Dodge).

3. Heavy engineering construction contracts awarded (McGraw-Hill).

4. Housing-starts (Bureau of Labor Statistics).

5. Vacancy rates and inventories of unsold new homes (local associations of building contractors).

These series duplicate one another in many instances. To illustrate: For a new apartment building a permit will be issued, a construction contract will be let and the unit will be included in the BLS housing-starts.

Data on actual regional construction expenditures often are unavailable, but usually data on construction employment can be obtained. It is possible, therefore, to compare the pattern of construction employment in an area with each or the aggregate of the 5 series listed above. Preferably, all such data should be corrected for seasonal influences before making such comparisons. Normally the ups and downs of construction employment will follow the ups and downs of these series. Sometimes a weighted index, composed of these several series, can be developed which may clearly lead the fluctuations in construction employment and expenditures.

The probable future spending pattern of the state and local governments in a given area may be obtainable and may prove to be useful in regional forecasting. Government spending normally is budgeted in advance and these budgets usually are public information. Some federal expenditures in a given region may also be determined in advance of their actual occurrence and the results can be considered in the preparation of an area forecast.

Industries in some regions will often follow the national pattern for that industry. This has occurred in the machinery, chemical, and electrical industries. It is useful, therefore, to examine the different industries in an area and to estimate to what extent they are likely to parallel the national pattern.

In many cases data are available on the

national outlook for a given industry because statistics have been collected and published on the industry's order backlog situation, the trend of new orders, the over-all level of production and sales, and inventory conditions. From this information, short-term projection of the industry on the national level is possible. An analysis can be made as to whether or not the pattern of a given industry in the region under study has in the past followed the national pattern. If the past correlation has been close and there are reasons for believing the relationship will continue, then the national data can contribute to the building of the regional forecast.

In making this forecast, consideration was given to the possibility that certain types of Los Angeles business statistics might, as a group, tend to lead the ups and downs in local economic conditions. To test this hypothesis, such series as bank loans, new incorporations, length of the work week, construction contracts awarded, and department store sales were examined. None of these series, however, either singly or in combination consistently moved upward and downward prior to like-movements of the over-all Los Angeles economy. The possibility of using leading indicators in regional forecasting for Los Angeles does not appear to be practicable until more sensitive indicators become available. Other regions appear to suffer from the same statistical deficiencies.

In summary, forecasts of regional business conditions may be developed by the carrying out of the following types of analysis:

1. Evaluation of the trends in advance-commitments for such expenditures as construction contracts awarded, orders for manufactured goods on hand by the major local producers, and budgeted government expenditures, *etc.*
2. Analysis of possible imbalances in the region's economy which may exist because the major business firms in the area typically have excess inventory and industrial capacity—or the reverse, or because the area has recently undergone a construction boom and has a surplus of housing and other structures.
3. Review of possible secular trends such as population movements and expenditures by state and local governments in the area.
4. Evaluation of the dependence of the region on national business conditions or some major sector of the U. S. economy, such as the defense program.

MANAGEMENT USE

While the prime concern of this paper has been to review some possible procedures in preparing regional forecasts, it may be worthwhile to devote some attention to the problems of incorporating the forecast into the broader planning activities of business firms. Limitations of the usefulness of forecasts need to be considered, as well as ways of holding down the cost of the forecasting effort.

The individual firm, in order to establish sales quotas, inventory levels, production schedules, budgets and financial plans, needs to anticipate its future sales trends. These trends often will depend primarily on the future fluctuations in regional business conditions, the firm's competitive position in the industry, and the competitive position of the industry within the economy of the region.

As part of the procedure in developing sales expectations, it is often helpful to compare past fluctuations in company sales with fluctuations in regional business conditions. The latter can often be best measured by studying the region's employment statistics which, unlike many other indications, are usually available on a monthly basis. If company sales tend to correlate to at least some degree with regional employment, then a carefully prepared and reasonably reliable forecast of regional employment may be given some weight in projecting company sales.

Sometimes company sales need to be corrected for random and nonrecurring factors, as distinguished from seasonal movements, before a correlation with regional employment is attempted. A strike against the company or its competition, sudden price movements or product changes, or a marked shift in the marketing effort might upset a relationship between company sales and regional employment that is usually somewhat stable. Only after getting the best possible correction for random factors can the influence of fluctuations in regional employment be properly evaluated as an influence on sales. In anticipating future sales, of course, the random factors need to be taken into account along with regional business conditions.

Although it is important to know the contribution forecasts can make to business planning, it is perhaps equally important to know their limitations. Many forecasts will be of limited accuracy. The use of forecasts by business firms does not eliminate their need to seek flexibility in being able to step up or contract their level of activity as new information concerning sales demand becomes available. Also, a continuous effort needs to be made to gain additional evidence concerning future market strengths. Thus, while forecasts are useful, they are not a substitute for flexible operations and continuous reviews of the probable market strength.

Many departments in a business firm may make use of regional business forecasts. The purchasing department may want estimates of probable price trends of purchased items and their availability. Product planning departments are interested in whether consumers are likely to switch to higher grade products, a switch that may be in part influenced by trends in regional business conditions. In facility planning, there is often the need for long-range regional economic growth estimates. In financial planning, estimates of the future availability and cost of funds may be useful (al-

though here the forecast needed may be more influenced by national than regional business conditions). The most common uses of regional forecasts, of course, are in helping to develop sales estimates.

Some forecasts result in the establishment of upper and lower limits for the probable level of business activity. In deciding which limit to use, it is often helpful to work out the financial risks that will be incurred if (a) the high level is assumed and (b) the low level is assumed. If a firm sets its goals relatively high and the market proves to be weak, an excessive investment in inventory may result. If the goals are set lower and the market proves stronger, lost sales and lower profits may follow. A comparison of the extra cost of excessive inventory versus lost profits will tell whether the financial risk of setting the goals high is greater than that of setting them low.

Source and Nature of Regional Data

Those responsible for the development of regional forecasts will find the following sources of regional business statistics useful. Each of the twelve Federal Reserve Banks puts out a monthly letter which includes many statistics on regional business conditions. For the most part these data provide a description of past trends. Bureaus of business research in state universities conduct research and studies that are highly varied. But many of the studies are useful in anticipating future trends in local economic conditions. The U. S. Departments of Labor and Commerce regional offices gather considerable regional statistics on employment, population, housing, banking, *etc.* Commercial banks, chambers of commerce, and trade associations are often in close touch with individual firms and the general sentiment of the business community regarding local economic trends.

Consultant Help

A firm lacking its own economic staff and attempting for the first time (a) to forecast the

probable trends in local business conditions and (b) to use such forecasts in its planning, may do well to obtain some experienced assistance to put into practice the principles and procedures discussed in this article. This assistance may come from a private consulting firm, a university research center, a trade association, or a government agency. Prior experience can make a most valuable contribution to the establishment of efficient procedures in forecasting. A high degree of knowledge and

judgment is called for in obtaining, analyzing, and interpreting business statistics. In addition, allowance should be made for the fact that often several or more attempts at forecasting need to be made before much accuracy can be expected. These warnings about forecasting should not be interpreted as advice against such attempts but rather as a plea for patience and care in undertaking this aspect of management planning which has such high potential usefulness.

The closer we come to reality, the more we must recognize that we are dealing with innumerable streams of tendency, running parallel, blending, conflicting, clashing violently; coming from origins we cannot always trace; and never lying wholly on the surface.

William A. Orton

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WILLIAM J. PLATT

Profits from the Decision Laboratory

How operations research is "shrinking the area of decision-making in which management must rely solely upon intuition."

The same concepts and approaches which have helped scientists bring us to the threshold of the space age are also helping corporate management make the right decisions and run their businesses more effectively. The results are not as glamorous as those technological achievements known by such names as Atlas, Titan, Thor, and Jupiter. But operations research offers the businessman bigger profits and improved effectiveness in major operating problems, and management is getting more and more interested in this new science of decision.

Operations research is a child of World War II. During the War, scientists—first in England and then in the United States—began using scientific techniques to help military decision-makers evaluate alternative courses of action. Since the war, all the military services have made increasing use of operations research and systems analysis in selecting optimum weapons systems, strategies, and tactics. Each service now employs hundreds of analysts in these activities. In addition, most of the major weapons contractors have their own staffs to conduct operations research as part of weapons system design.

The impact of operations research is spreading in industry. A recent American Management Association survey shows that of 631 com-

panies replying to a questionnaire, 51% were using operations research. None of this same group had responded to a poll in 1951 with the statement that it was then using operations research. Despite its increasing popularity, however, there is still a good deal of confusion about the specific nature and uses of operations research—the science of management.

A TYPICAL OR PROBLEM

The kinds of problems to which operations research is applicable can be illustrated by a problem common to all manufacturing—that of scheduling purchased parts. The problem here is to decide how much work-in-process inventory of such parts to carry.

Everyone associated with manufacturing knows that there is no pat answer to the question of inventory level because of many complexities, some of which argue for small inventories, and others of which argue for large inventories. Arguing for large inventory are such factors as discounts on purchase price for large quantity orders, low per-unit costs of ordering and transportation for large amounts, and low shortage costs in assembly when parts are in ample supply.

On the other hand, the interest and opportunity cost on money tied up in inventory,

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obsolescence costs of design changes, and the cost of warehousing all argue for small inventory. Complicating the problem are a number of uncertainties, including schedule variations in the usage of purchased parts in manufacturing operations, lead-time uncertainties from order-placement to delivery, and scrap and rejection rates.

Consider the conflicts inherent in this problem from an organizational standpoint. The production manager wants a great surplus of parts so that shortages will never delay manufacturing. The vice president of finance wants the very minimum inventory to keep down working capital needs. The head of stores wants to keep inventories within limited warehousing space. The purchasing agent and material control supervisor are caught in the cross fire.

It is clear that a management policy is required—one that takes into account all of these various considerations, but, in the light of conflicting costs and many uncertainties, how does one determine the best level of purchased parts inventory by item or by class of item? To put the question in the language of operations research, what is the optimum inventory level?

Operations research is at home in problems of this type—those in which operational and cost conflicts must be resolved through compromise to achieve the optimum. The management scientist approaches this kind of problem much as the physicist or the chemist approaches a problem in his laboratory. Operations research takes place in what could be called the “decision laboratory,” and the man who works in the decision laboratory is the management scientist.

METHODS IN THE DECISION LABORATORY

The process the management scientist uses in the decision laboratory is the same scientific method the physicist or biologist or other scientist uses:

1. He determines the objective of his investigation.
2. He constructs a model or hypothesis that describes the phenomenon.
3. He collects observations.
4. He develops a solution or theory.
5. He tests the model or theory and its solution.
6. He puts the solution to work.

In greater detail, then, he proceeds as follows:

He determines the objective of the operation. This results in establishing what in operations research is called “a measure of effectiveness,” or a criterion by which to evaluate policies or rules. In the purchasing problem this objective might be that of minimizing the sum of all the conflicting costs at an acceptable level of service to the manufacturing operations. In the particular problem of parts scheduling, the level of service would probably be measured in the expected frequency of shortages.

He constructs a model, usually mathematical, to describe the operation under study. In doing this for our inventory problem, the scientist could adapt a growing amount of inventory theory to the special problem at hand. His mathematical model would simply be a description, in numerical terms, of the relationships among the cost factors. In inventory problems, cost factors can be grouped into (a) holding costs (investment and warehousing), (b) ordering costs, and (c) shortage costs. The model would be designed to resemble the real world as much as possible. For this purpose the scientist would allow for differences in unit value of purchased parts, for the uncertainties of lead time and usage, and for obsolescence and other factors, called “parameters” by the scientist.

He collects data and observations. The scientist in the decision laboratory seldom has an opportunity to conduct the controlled experiment that his counterpart in the physical sciences can. The management scientist, however,

must be just as careful in collecting reliable observations. In the inventory problem, he would gather all the types of cost information and data for each of the variety of conditions in which these factors might differ.

He develops a solution from the model. In the inventory case the solution would be an expression for the level of inventory that will best meet the objectives established in the first step.

He tests the model and the solution derived from it. In the inventory problem he might perform the test in one of several ways. A commonly used one is that of computer simulation. The electronic computer is the most glamorous of the management scientist's tools. While it is often called a giant brain, actually it's pretty dumb. It does only what it is told, and often you can talk to it only in a rather obscure binary language. Once instructed, though, it does its job with lightning speed.

In computer simulation, in effect one asks an electronic computer to re-run past operations, but in doing so to substitute a new and presumably more nearly optimal set of decision rules to replace those which guided the actual operation.

In this kind of simulation, the computer is not allowed to use hindsight. Instead, at any point in simulated time, it has only the same information and estimates of the "future" that existed in the real world at that time. Peeking ahead to such things as future demand or lead time slippage would be cheating and would invalidate the test.

While engaged in simulating a past period, the computer can be programmed to keep track of all costs of operating under the new decision rules. In the inventory problem it could keep track of the number of times orders were placed, hence the ordering cost; the amount of money and warehouse tied up in inventory, hence the holding cost; and finally the number of times delays occurred from being out of stock, hence the shortage cost. The data-

processing power of the modern electronic computer usually permits the simulation of many months of real-world activity within a few minutes.

When the simulation is completed, the new inventory level rules can be compared with past policies. These comparisons are in terms that management can appreciate—annual savings in the sum of ordering costs, holding costs, and shortage costs.

Finally, the management scientist puts the solution to work. In the inventory problem this can often be done with virtually no change in procedure other than translating the solution into a set of tables for guiding the purchasing of parts. These tables might show, for example, the best order quantity and best minimum stock for each combination of unit value, lead time, and usage rate.

PRODUCTS OF THE LABORATORY

The problem of how to schedule manufacturing as a whole is an extension of the purchased parts inventory problem, because in production one is creating inventory, either work-in-process or finished goods. We have the same problem of what schedule is best in light of conflicting costs. But an important new dimension is added: that of allocating limited production capacity.

A useful approach to the allocation problem is the linear programming model, which well describes many real production scheduling problems. The "linear" in linear programming refers to mathematical relations in which costs (or some other input) are directly proportional to quantity produced (or some other output). The other principal feature of the linear programming model is its incorporation of restraints, or limitations imposed by nature or by the realities of the existing situation. For instance, if the production of each product requires a certain amount of equipment or other plant capacity per unit produced, the total amount of such capacity imposes a restraint

upon the output. Linear programming of production can allocate available capacity in such a way as to maximize output in quantity or in dollar value, or in such a way as to minimize costs.

In short, by organizing essential facts and relations between facts, the management scientist can construct an objective basis for executive decisions. Management selects the objectives and assigns a system of relative values to them. The management scientist explores the consequences of different policies on these various objectives in the light of the established scale of values.

Setting policy rules quantitatively is known in operations research as "decision-making." Making the decisions to resolve conflict situations as favorably as possible is called "optimization." Because of the uncertainties inherent in the environment within which the opposing forces must usually operate, the process of optimization must be aimed at getting the best results on the average. Probability theory and statistics are thus involved in the research.

This, then, is operations research: a set of special research techniques coming from mathematics, statistics, and data processing applied to the practical management problem of optimum decision-making.

Here are some of the major management decisions on which operations research is being used:

- Allocation of personnel, of funds, of production effort, or of sales effort.
- Scheduling of production, services, or flows.
- Control of inventories of raw materials, repair parts, intermediate or finished products, as was described in our sample case above.
- Distribution of inventories among warehouses or distribution of product to final users.

- Planning the location of facilities including plants, warehouses, or branch outlets.

The underlying problem in each of these examples is that of optimum allocation. In the allocation of effort, the allocation is usually among a limited number of alternatives or pigeon holes. In the scheduling example, the problem is allocation of operations in time. In the inventory control example, inventory dollars are being allocated over different products to provide optimum protection against such contingencies as delays in receipt of new stocks or variations in demand. In the distribution example, flows are allocated among different routes to minimize costs of handling and transportation. Finally, in facility planning, investment funds are allocated over space and time to provide optimum patterns of location out to a given planning horizon.

In each of these examples there is a basic conflict to be resolved between the objective of cost reduction and the objective of providing a high level of service or effectiveness. Usually, level of service is not a single entity which can be directly measured, but a composite of several different service factors. While the operations analyst can help devise methods to measure the different service factors, management must assign them relative values.

In many management problems—including the ones mentioned in this article—the interests of various departments or activities may conflict with one another. Schedules that are most economical for production may fail to comply with delivery dates promised by sales. Distribution plans that reduce costs may also delay shipments or restrict the variety of products that can be supplied from a given terminal. Economizing on buffer stocks carried in inventory will increase the frequency of back orders or lost sales. Optimization serves to resolve such conflicts of interest, but only in accordance with the system of relative values established by management.

The problems of business would disappear entirely if there were a crisp, elegant mathematical solution to all complex management decisions. Unfortunately this is not the case. Certain mathematical formulations that can be solved for optima do describe some real operations reasonably well. Other real-world operations are well beyond the most advanced mathematical description. But even here the management scientist is beginning to get some exciting research results. He does this by using the principal piece of equipment in his decision laboratory—the electronic computer.

Using the computer, the management scientist can go beyond the capabilities of analytic techniques and simulate tough problems by computer experimentation. Here the scientist again makes a model, reproducing by numerical processes a reasonable description of the operation being studied. For this purpose, however, the description does not have to be a set of mathematical equations with a unique solution. Instead, a computer is used to experiment systematically with a range of alternative courses of action.

Computer experimentation may be compared with playing chess and being able to look at a considerable range of alternatives several moves ahead. The management scientist has a chance to experiment with several policies or configurations, to readjust these in the light of the expected outcome, and to eliminate courses of action that have low probabilities of success.

Some of the problems on which computer experimentation has been used include the following:

- The selection, for a large food processing

company, of the number, size, and location of production and warehousing facilities for minimum cost operations at feasible levels of customer service.

- The design and operation of a bus terminal.
- The handling of customer services at a busy airline ticket counter.
- A business game which simulates for top executives the decisions involved in competing with other firms.
- The maintenance situation at a major airline station.

The beauty of computer experimentation is that it is cheaper than experimenting with such real-world objects as oil refineries, assembly lines, construction projects, advertising programs, or people. It also takes less time because of the ability of the computer to compress time. Finally, of course, failure in computer experimentation is not as likely to be fatal to management as the same unsuccessful experimentation in real operations.

Today the management scientist is working with policy-making groups in the military services and in industry. Important developments are coming out of the decision laboratory. By using the methodology of science, the formulations of mathematics, and the experimentation capabilities of the electronic computer, the management scientist is shrinking the area of decision-making in which management must rely solely upon hunch and intuition. Today's manager spends far less time musing about "What would happen if . . ." He puts management scientists to work to find out.

It is evident from what executives say that they make their important decisions subconsciously. This observation is not so surprising as it might appear at first sight, for all creative thinking, including "rational" scientific research, emerges from the subconscious. All that science itself can do for the art of decision is to offer the aid of techniques designed to explore the physical consequences of decision. It seems likely, as technical and organizational complexities in industry increase in the future, that executives will come to lean more on such techniques.

The Editors of Fortune,
The Executive Life

JAMES R. JACKSON

Learning from Experience in Business Decision Games¹

You will get a new perspective on business-gaming from this survey of the types and uses of a "powerful tool" for the training of managers.

The best known business games are parlor games intended for amusement, such as *Monopoly* and *Easy Money*. Games and game-like activities oriented toward training in interpersonal relations, such as role-playing sessions, are also familiar. Less publicized, but of growing importance, are games specially designed for experimental research on organizations and management. The business decision games with which I am now concerned are closely related to parlor games, role playing, and research games. They are fun. Their players *do* assume roles. Their research possibilities are significant. But their purpose is different. They are designed as tools of education and training in business decision-making.

¹ The research underlying this article was supported in part by the Management Sciences Research Project, under contract to the Logistics Branch, Office of Naval Research, and in part by the Division of Research, both in the Graduate School of Business Administration, UCLA. Reproduction in whole or in part is permitted for any purpose of the United States Government. *UCLA Executive Decision Game No. 2*, reported upon here for the first time in print, was developed by several persons, including Tibor Fabian (who initiated work on it), James L. McKenney, and Kendall R. Wright. Detailed computer codes and wiring instructions are available, from the Management Sciences Research Project, UCLA, for those who have the use of an IBM 650 computer and an IBM 407 tabulator and who wish to run the game in their own organizations.

These business decision games are "rule games," whose procedural requirements, scoring systems, etc., are clearly defined and depend only slightly (if at all) upon the judgments of referees. In this, and also in their emphasis upon "concrete results" instead of upon the attitudes and emotional responses of their participants, they differ from such activities as role playing. Compared with parlor games and most research games, they are based upon relatively realistic and straightforward representations of business situations and management functions, although strict realism is rarely sought.

Business decision games require sequences of decisions from their players. Corresponding sequences of reports on results of the decisions are fed back to the players, often very soon after decisions are made. The players are given only incomplete advance information as to how their choices will influence operations and the consequent reports. A major problem (sometimes the major problem) is therefore to "learn from experience," while playing, how the game really works.

Origins. Because business decision games are new, and exploration of their possibilities hardly begun, this article—which on the sur-

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face is a report concerning recent and current developments—is really aimed more toward the future than the present. It is appropriate, though, first to glance briefly toward the past, at the origins of the new games. Their direct ancestors are war games, dating at least from the German *Kriegspiel* of the mid-nineteenth century. Perhaps the most famous and also the most ambitious war games were conducted at the Total War Research Institute and the Naval War College of Japan, as part of Japanese preparations for World War II. Strategic and tactical games played at the United States Naval War College are also well known; and in recent years much publicity has been given to a variety of war games used by the United States Armed Services.

Many of the more complex war games, especially those at the level of grand strategy, have been concerned in part with the logistical aspects of warfare, and even with fairly broad problems of industrial support for the military. In 1955, RAND Corporation developed a game which focused upon U. S. Air Force logistics. This game, called *Monopologs*, requires its players to act as inventory managers in a simplified simulation of the Air Force supply system. *Monopologs* is considered by the Air Force to be highly successful as a training device. Its success, perhaps more than any other single factor, spurred the development and implementation of the concept of business decision games.

Types of business decision games. The first business decision game to become widely known was developed in 1956 for the American Management Association, by C. J. Craft, Richard Bellman (a RAND mathematician), D. G. Malcolm (of Booz, Allen & Hamilton), and others. In this "top management decision simulation," five teams of players control manufacturing firms, which compete in a hypothetical, one-product industry. Each team makes quarterly decisions for its firm, governing product price, production volume, and budgets for

plant investment, research and development, marketing, and market information. The "scoring system," based upon an economic model, is coded so that an IBM 650 computer will work out the consequences of decisions and (with the help of an IBM 407 tabulator) quickly prepare reports on sales, revenues, costs, profits, etc.

After a few trial runs and some polishing, this game was made the central feature of a special two-week course at the AMA's Academy of Advanced Management, Saranac Lake, New York. It attracted many favorable and even enthusiastic comments from executives and scholars who participated in the trial runs and in the two-week course. Its success has much influenced several researchers who have independently worked on games of the same general type. One of three such games developed at UCLA by my associates and myself is described below in some detail, and a few others among the many existing "executive games" are discussed in general terms.

The executive games are the glamorous entries in the field of business decision-gaming. They represent big problems in a big way, with expensive electronic computers, large staffs, and loud fanfares. These games are often played by high level executives, who sometimes pay substantial sums for the privilege. But I feel that games of a far more down-to-earth sort are of equal interest to those seriously concerned with management education and training. For lack of a better term, I shall call them "specialized business decision games."

These games relate to restricted problems associated with functionally specialized areas in business management—including problems of inventory control, record maintenance, machine repair, production scheduling, and even bargaining. As an example, a game developed by J. F. Lubin, at Wharton School, requires players to place purchase orders for future delivery, month-by-month, to control the inventory of an item whose sales vary in a partially

unpredictable fashion. A competitive element is present because of the limited capacity of the supplier (who is not a player, but whose actions are determined by the rules of the game). The purpose of playing is to learn about the process of striking balances among the costs of carrying inventory, stock shortages, and placing, cancelling, and expediting orders. A simpler, "solitaire" inventory game, used in undergraduate and graduate courses at UCLA, will be fully described in this article.

The specialized business decision games have received far less attention than they deserve, perhaps mainly because they are usually unspectacular—even commonplace—in comparison with their glamorous relatives, the executive games. They do indeed present relatively limited and often unexciting problems, but they present them in relatively realistic ways. Consequently, although these games are not always pertinent to top management work, their value for specialized educational and training purposes is clear.

In recent months, there has been much interest in building complex games which will include many features of both the executive games and the specialized games which already exist. Researchers at several universities are developing games which will call for organizational hierarchies of players, some filling top management posts, and others occupying relatively specialized positions. (The ultimate extension of such gaming would be a real business firm, or even an island economy, managed by students and trainees, primarily as an exercise.)

WHAT GOOD ARE BUSINESS DECISION GAMES?

It has been suggested that interscholastic decision-gaming could become a popular new sport peculiar to business schools, and that high-stakes executive games could profitably be introduced at a suitably chosen watering-

spot, to provide tired businessmen with an exciting new kind of busman's holiday.

I cannot quite picture a grandstand of rooters shouting as one man, "Get that market!"—but it is true that both players and administrators of executive games often describe them with such words as "absorbing" and "exciting." Excessive claims may be made for the games, in the flush of enthusiasm, and such claims may even be supported by "disinterested" players. I suspect myself as well as the next man, and hence must issue a warning that the following paragraphs are full of personal conjectures. The games are too new to have been evaluated scientifically, or to have undergone the test of long use. Consequently, evaluations must for the moment be largely matters of opinion. I hope that a straightforward presentation of my ideas will help others to form their own conclusions.

The enthusiasm with which the games are played does itself contribute to their potential worth. Whatever the players do, they do energetically and with a high degree of concentration. Good play requires lots of hard thinking. Those who believe that mental exercise is beneficial in itself may agree with many players who have said that there was ample compensation for the time and effort spent on a game in the stimulation of brainwork alone. Good play in the team games requires effective organization and intelligent cooperation. The experience of working together is often mentioned as extremely worthwhile by those who play such games. Mental exercise and practice in teamwork are, however, features of business-gaming which could equally well be ascribed to bridge-playing, fund-raising for charity, and any number of other activities available to managers and management students and trainees. True, it is reasonable to hope that an activity centering upon *business-like* problems will be especially helpful toward developing effective approaches to *business* problems. But it still seems that if a strong case is to be made

for the games as tools of manager education and training, this case must rest upon more specific grounds, and depend upon something "special" about the games.

Feedback and learning in business decision games. A key characteristic of the new business games is that their players must discover for themselves where the problems lie and how the choices to be made relate to the solution of these problems. Players of executive games are not told, for instance, whether the "true road to greater profits" lies in rapid expansion or in the reduction of costs. Supposing a firm does wish to expand, the members of its management team are not told just how many new sales will result from a given increase in marketing budget or a given decrease in price. They must find things like these out for themselves through experience, often through bitter experience, as the game progresses. The possibility of learning rapidly from experience is enhanced by a fast-moving time scale, by detailed reports on results quickly presented once decisions are made, and also to some extent by greater freedom to experiment for the sake of information than is usually available in real life.

The secret of winning thus lies not so much in knowing about business as in being able efficiently to find out how things work in the particular situation at hand. The same is to a lesser extent true of the specialized business decision games.

It is partly *because* the business game is artificial and its problems cannot be solved on the basis of anyone's preconceptions that it provides "practice in utilizing experience effectively." Although a game is somewhat unreal, it may still pose a realistic problem of discovering what forces are important, how these forces work, and how they interact.

(The reader may wonder whether decision games would be equally valuable if they were not placed in business contexts at all. Some

reasons for answering this question negatively are obvious in relation to specific uses mentioned below. But the business context is desirable independently of these uses. Some reasonably familiar context is almost necessary to provide a framework in which the players can organize their understanding of the advance instructions and additional know-how obtained during the experience of playing. Equally important, the business-like nature of the decisions, their consequences, and the reports makes it easy to stimulate the kind of interest and concentration which is so necessary for efficient learning.)

Educational and training applications. The concentration and involvement of players make business decision games ideal tools for creating interest in their subject matter. By bringing the subject matter to life, a game encourages a high quality of work in related post-game study, and provides a focal point for thought and discussion. It can help greatly toward establishing a common basis for communication among players and between players and teachers.

One potentially important use of the games is to spark the critical analysis of specific assumptions upon which they are founded. The fact that the games are not completely faithful to reality little reduces their effectiveness in these regards; weaknesses sometimes turn into strengths by directing attention to the more difficult questions about how things *really* are in business. Executive games have been used with great success at UCLA as introductions to business economics courses, and by the International Business Machines Corporation to launch sales-training programs. Inventory-control games at UCLA have excited an unprecedented level of interest in the problems of inventory management, and the AMA is using specialized games to focus attention upon essential problems in production management.

The need to arouse interest is not, of course,

limited to formal educational and training situations. Business decision games have proved so effective for this purpose that I suggest to anyone—businessman, educator, or what-have-you—that whenever interest must be created it will be worthwhile to ask the question, “Can a game be used?”

Games can be used as demonstration pieces to teach and crystallize the significance of “principles,” much as the laboratory experiments in science courses provide demonstrations of physical or chemical laws. Existing executive games, however, are too hypothetical in structure for this application to be taken seriously, except in relation to some of the most general (and most important) requirements for effective management—good teamwork, careful planning and control, and balanced coordination of interacting factors, for instance.

It can be hoped that in time such games will be improved to the point where the *quantitative* aspects of business principles are realistically represented; executive games now reflect accepted principles, but in ways which are only qualitatively true-to-life. The use of games for demonstrating principles is legitimate in direct proportion to their faithfulness to reality. Executive games have often been misrepresented in this regard. It may soon be feasible to design executive games tailored closely to the patterns of actual firms and industries, thus making possible something close to a direct substitute for management experience. It may even be possible to pre-test proposed plans and policies in such games, a type of application which the U. S. Air Force (with RAND Corporation's assistance) has already made of a highly sophisticated materials-management game called *Simulogs*.

For the present, highly realistic games have been designed only to represent relatively narrow, almost “technical” problems (including, though, problems of vast complexity, such as

those treated by *Simulogs*.) These are most often problems which can be solved by systematic routines and which consequently do not really call for *individual* attention from managers. The games are most useful as exercises in setting up appropriate systematic routines, each of which would presumably be applicable in real life to a variety of related individual problems. Or, at a lower level (approaching that of the mere textbook exercise), such games can be used to give practice in applying specific techniques. The specialized games mentioned before, and many others, have proved highly effective as means for developing ability to work with the everyday decision problems of middle and lower management and management staffs.

I hope I will be pardoned for returning, repetitiously, to what seems to me the most interesting training purpose of existing business decision games: they provide practice in learning from experience. Just as specific knowledge of one industry has only limited pertinence to another, the specifics learned in the course of a game can be transferred to real life only with great care (if at all). But the manager's stock in trade, as a decision-maker, is not so much the knowledge derived from his education and experience as it is his expertness in making the most of new experience. I think this expertise is a major factor in what is called “good judgment.” And I am myself convinced that business decision-gaming is the most powerful means yet devised, short of experience itself, for cultivating the ability to make the most of experience.

The reader may be skeptical. He should be. I *am* an enthusiast, with a product to sell, and as yet without conclusive proof that this product has all the wonderful virtues which I see in it myself. But, putting personal enthusiasm to the side, I believe that the most conservative estimate of the potentialities of business decision-gaming at least justifies continued

interest on the part of businessmen and continuing developmental work on the part of researchers.

(A few words are called for concerning uses for business decision games in research on organizations and management. The possibilities are especially attractive for two reasons. First, experienced managers are available as "subjects," rather than the new draftees or college freshmen usually participating in laboratory experiments. Second, because the games themselves create compelling motivation, they eliminate the listless apathy typical of subjects in controlled environments. Little has been done so far toward utilizing the games for research, but a number of scientists are studying the opportunities.)

Who should play business decision games?

This question is difficult to answer, even assuming that the games do have substantial educational and training value, because it is not easy to decide for whom gaming will be beneficial in proper proportion to the necessary expenditures of time, effort, and money. I am sure that university curricular programs should incorporate games, both executive games and specialized business decision games, wherever they are pertinent and economically feasible. In the case of specialized games, the opportunities are limited only by the ingenuity of instructors and the time which is available for developing teaching aids. For reasons of cost, the executive games, at least those which require electronic computation, may be limited to students in the more advanced courses concerned with business decision-making.

The preceding remarks concerning curricular uses of business decisions games seem to me to apply, with minor modifications, to university manager-development courses and to company training programs. As higher management levels are reached, the relevance of specialized games will generally become less,

and more use of executive games seems appropriate. Many top level managers who have participated in executive games are enthusiastic about them, but I am doubtful as to whether such persons really "get anything" from playing, beyond mental stimulation (which may by itself be an adequate payoff). But even though questions concerning the real utility of business decision games are not yet finally answered, I feel that managers at all levels will still serve their own interests well by playing games, and thus participating in the necessarily slow process of discovering more surely where their true values do lie. As is so often the case in business research, the scientist cannot do his best without the active interest of the business world.

AN INVENTORY-CONTROL GAME

Because specialized games are more straightforward in concept than are the complex executive games, it is appropriate in getting down to specifics to start with one of them. The one to be described is of interest mainly as an example of its species, rather than for itself alone. The description will be in two parts: instructions for players, and additional information on setting up the game. Enough information is given so that the reader, if he wishes, will be able to set up and play the game himself, or administer it to others.

This game is a "solitaire" inventory-control game. It is designed in such a way that none of the standard, quantitative, order-reorder-policy models is directly applicable. A moderately sophisticated analysis, however, will lead to a computational technique closely approximating optimal policies for the specific problem posed and others of the same type. The accuracy of such a technique of course depends upon accurate estimates of the relevant parameters. The player is required to start acting as an inventory manager with only a very brief "past history" available. Thus, even

if he is expert at analysis, he must still work into the problem sequentially, as the progress of the game yields additional data.

Instructions for playing the inventory-control game. This game is concerned with an inventory-management problem. Exhibit 1 summarizes thirteen weeks of the ALCU Company's inventory records for Vistascream television sets. Initial Inventory, Sets Received, Total Inventory, Customer Orders Received, and Sales are tabulated for each week. Three cost items are also listed, as follows:

Inventory Carrying Cost. Two dollars per set per week, figured on Total Inventory for the week.

Cost of Placing Orders. One hundred dollars per order placed, regardless of quantity, incurred in the week when an order is placed. (This is not purchase cost, but the incidental cost of paperwork, etc., associated with the transaction.)

Cost of Lost Sales. Forty dollars per sale lost

due to shortage of stock, representing profits which would have been earned had the sales been made. Note that no back-ordering is possible.

These three costs are the *only* ones considered in the game.

In playing the game, you will spend two accelerated years as the Inventory Manager responsible for ALCU's Vistascream line. Demands on inventory will be determined by cutting a special deck of playing cards. You will need sheets of paper ruled and numbered as continuations of Exhibit 1. These ruled sheets will serve as tables on which the following entries are made "each week":

1. Initial Inventory. Enter the difference between the previous week's Total Inventory and Sales.
2. Total Inventory. Add Goods Received to Initial Inventory, and enter this sum.
3. Carrying Cost. Enter twice the Total Inventory (the cost is \$2 per set carried).

EXHIBIT 1
INITIAL "HISTORY," INVENTORY-CONTROL GAME

Week Number	Initial Inventory	Sets Received	Total Inventory	Customer Orders received	Sales	Carrying Cost	Cost of Placing Orders	Cost of Lost Sales
1.....	40	0	40	7	7	\$ 80	\$ 0	\$ 0
2.....	33	0	33	8	8	66	100	0
3.....	25	0	25	5	5	50	0	0
4.....	20	0	20	12	12	40	0	0
5.....	8	0	8	10	8	16	0	80
6.....	0	60	60	6	6	120	0	0
7.....	54	0	54	7	7	108	0	0
8.....	47	0	47	8	8	94	0	0
9.....	39	0	39	6	6	78	0	0
10.....	33	0	33	13	13	66	100	0
11.....	20	0	20	6	6	40	0	0
12.....	14	0	14	3	3	28	0	0
13.....	11	0	11	4	4	22	0	0
14.....	..	60	..	..	..	..	..	..
15.....	..	0	..	..	..	..	..	..
16.....	..	0	..	..	..	..	..	..

4. Customer Orders Received. This is a statistical quantity, determined by cutting the special deck of playing cards. The cards are valued as follows: Joker, 0; Ace, 1; numbered cards, "face-value"; face-cards, 0. Proceed as follows, moving to Step 5 as soon as an entry is made:

- a. Cut one card. If it is not a face-card, enter its value. If it is a face-card, go to Step 4b.
- b. Cut two cards. If neither is a face-card, enter the sum of their values. If either or both are face-cards, go to Step 4c.
- c. Cut four cards, and enter the sum of their values.

5. Sales. Enter the smaller of Customer Orders Received and Total Inventory.

6. Cost of Lost Sales. Enter forty times the difference between Customer Orders Received and Sales (a lost sale implies a lost profit of \$40).

7. Cost of Placing Orders. If you do not wish to place a purchase order this week, the entry is "0." If you do wish to place an order, enter "100" (the cost of actually placing an order is \$100).

8. Goods Received. Count ahead four weeks from the present; this is the line on which the entry is to be made. If no order is being placed this week, enter "0." If you are placing an order this week, enter the quantity ordered.

"Zero" entries in Steps 6, 7, and 8 need not actually be written. It may be convenient to enter Initial Inventory for "next week" before carrying through Steps 7 and 8 for "this week." The playing cards should be thoroughly shuffled every few "weeks."

Your "moves" in the game are the choices described in Steps 7 and 8, above. You must decide when to place orders and in what quantities. The object of the game is not just to cut current costs, but to "zero in" as quickly as possible on a systematic, routine policy which

will provide optimal results, or nearly so, in the long run.

An optimal policy is technically defined as one which will in the long run result in the lowest average over-all costs. Such a policy must properly balance the cost of placing orders against the cost of carrying inventory, and the cost of lost sales against the cost of carrying reserve stock. A slightly more subtle relationship calls for balance between frequency of placing orders (and hence of low points in stock) and the cost of lost sales.

A final object of the game is to devise a systematic procedure for selecting an optimal or near-optimal policy to fit any problem with the basic characteristics of the specific problem which the game presents.

It is "cheating" to count through the special deck. You are allowed to know nothing about its make-up except what you can infer from the data given initially and what is developed in the course of play. And, of course, it is "cheating" to determine future sales orders before placing purchase orders.

Setting up the inventory-control game. The main omission from the instructions above is the make-up of the special deck of playing cards. This can, of course, be varied. The following deck has been used in classes at UCLA: 1 Joker; 1 Ace; 2 Deuces; 4 Treys; 6 Fours; 8 each Fives through Eights; 5 Nines; 3 Tens; 3 face-cards.

In presenting the game to a group, one person can do all the cutting of cards. It may be desirable to run through a few weeks, carrying out the calculations in detail, using some simple, routine order-reorder policy. The last three paragraphs of the instructions should be modified to suit circumstances and purposes. In particular, if analytic treatment of the problem is desired from inexperienced students, additional hints may be called for. Also, informal comments are desirable to emphasize that the game is an *exercise in method*, based on a

problem similar to many real inventory-management problems, but not necessarily identical with any one of them. I shall not presume to give further advice concerning the administration of this game to classes, since individual instructors will best fit their own purposes with their own techniques.

Experience with the inventory-control game. The game described above has been used in business-school courses on "operations analysis," to introduce inventory-control problems and arouse interest in them, to illustrate forcefully the difference between problems posed in terms of raw data and the more common textbook problems posed in terms of analytically convenient assumptions, and to provide practice in setting up and solving order-reorder policy problems. In all these regards I feel it has been highly successful. Although a few students at first "pick on" some of the unrealistic features of the problem posed by the game, they soon recognize this as an *inventory-like* problem in its own right, and become involved in it. This involvement becomes very deep indeed in directly competitive games based upon the prototype above, but in which the players clash in purchasing from a supplier with limited capacity. Post-game probes indicate that the various inventory games used do not "teach" any of the unrealistic details of the game situations as if they were typical of real life.

There is no need to describe the many ways in which the inventory-control game can be modified to include such factors as variable "pipeline time," quantity discounts, limited back-ordering, competition for the supplier's capacity, etc. Nor would any purpose be served through enumerating specialized games used at various universities, by the AMA, and in private industry. Such games are not difficult to devise in relation to any aspect of business operations which is well enough understood to be simulated computationally. I hope that this

article will encourage others to design their own games and to use them for their own purposes in management education and training.

UCLA EXECUTIVE DECISION GAME NO. 2

Three executive games have been developed at UCLA. *Game No. 1*, which was first played in the spring of 1957, has been superseded by the more refined *Game No. 2*. *Game No. 3*, utilizing the Western Data Processing Center's giant new IBM 709 computer, is now only to the test-run stage. Consequently *Game No. 2*, which has been used by a number of universities other than UCLA and also by several business firms, is the best suited of the three for detailed discussion. This game has been run many times, with widely varying participant groups. As measured by participants' evaluations, it has generally been highly successful. Even those few players who have said that *they* got little from it except amusement have almost all named *someone else* whom they thought would benefit substantially from playing the game. Most of my conjectures concerning the values of executive games, set forth in an earlier part of this article, are based upon opinions of players in the game now to be discussed.

The bulk of the discussion is a straightforward description of the game, in the form of a condensed and slightly generalized version of the instructions given to players.

As a preliminary to the formal instructions, players are usually told briefly about business games in general and their purposes. What is said amounts to a capsule version of the preceding portions of this article. Questions are invited throughout the instruction period, but the administrator of the game reserves the right to give incomplete answers. As a substitute for more thorough instructions and the knowledge which would in a real business be inherited from past managements, a short, un-

scored practice period of play usually precedes the "main run" for a group.

General. The UCLA executive game simulates a multi-firm, one-product industry. There may be as few as two firms or as many as nine. Time is accelerated to a rate of approximately one year per hour or two of actual play. Six to seven years are simulated by one play of the game, sometimes in a single day, and sometimes in a series of one- or two-hour sessions.

A team of three to six players forms the top management of each firm, and guides it by making decisions on the following quarterly:

- Price of product.
- Production volume.
- Advertising and selling budget.
- Research and development budget.
- Investment in plant and equipment.
- Dividend.

The decisions are filled into preprinted forms, which are designed to facilitate keeping track of past policies.

When decisions have been made, they are taken to a computing room and punched into cards which are fed, along with cards summarizing the state of the industry at the end of the preceding quarter, into an IBM 650 computer. This machine is programmed to simulate a quarter's operations and produce cards from which an IBM 407 tabulator prepares the following confidential reports for each firm:

- Sales Volume
- Percent Share of Industry Sales
- Current Inventory Quantity
- Production Capacity for the Next Quarter
- Statement of Profit and Loss
- Statement of Receipts and Disbursements
- End-of-Quarter Statement of Financial Condition.

Exhibit 2 is a facsimile set of reports. The Operating Statements covering a given quarter's operations are returned immediately after the decisions have been made which will guide operations during the *following* quarter.

In addition to these reports, the teams are notified of their competitors' prices immediately after each quarter's decisions are collected. They are also kept up-to-date on predicted and actual values of a general business index of special pertinence to the hypothetical industry of the game. Annual summaries of the operations of all firms are posted shortly after the end of each year. The game has usually been played in one large room, whose atmosphere, with these reports posted, has been compared to that of a wide-open book-making establishment. Espionage by eavesdropping is sometimes feasible.

It is usual to concentrate about half of the total time for a year's decision-making in the period when annual summaries are published. Over-all plans are then made, but may be modified at any time during the rest of the year. The time scale is firmly set by those who administer the game. Lunchbreaks are given, but intermediate breaks must be arranged within the teams, much like "vacations" in real life. The schedule usually allows two or three hours for pre-game discussion and the unscored practice period, as well as an hour or two for post-game analysis of results and the reasons therefor.

Management's job. Management's job in the UCLA executive game is to balance the controllable factors in such a way as to make the most of available resources and potentialities. All firms start from the same position, with the same sales, inventories, prices, *etc.* The industry can raise itself up as a whole. At the same time, the firm whose management team learns most quickly what the essential problems of the game are, and how to cope with them, can pull far ahead of its competitors in the course of a few years of play.

Efforts to increase sales must be properly related to costs, both in terms of enlarged budgets for advertising and for research and development and reduced margins resulting from price cutting. Marketing efforts must be

EXHIBIT 2
TYPICAL REPORTS, *UCLA Executive Game No. 2*

OPERATING STATEMENTS

FIRM 3 PERIOD 14

SALES VOLUME	451,806
PER CENT SHARE OF INDUSTRY SALE	14
CURRENT INVENTORY QUANTITY	287,597
PRODUCTION CPY NEXT QUARTER	604,209

PROFIT AND LOSS

INCOME	SALES REVENUE		\$ 2,990,956
EXPENSE			
	MANUFACTURING COSTS	\$1,676,478	
	REDUCTION IN INVENTORY VALUE	444,582—	
	ADMINISTRATION	393,348	
	ADVERTISING AND SELLING	200,000	
	RESEARCH AND DEVELOPMENT	400,000	
	DEPRECIATION	302,107	
	MISCELLANEOUS	253,412	\$ 2,780,763
	PROFIT BEFORE INCOME TAX		\$ 210,193
	ADDITION TO INCOME TAX FUND		\$ 109,300
	NET PROFIT AFTER INCOME TAX		\$ 100,893
	DIVIDENDS PAID		\$ 50,000
	ADDITION TO OWNERS EQUITY		\$ 50,893

RECEIPTS AND DISBURSEMENTS

RECEIPTS	SALES REVENUE		\$ 2,990,956
DISBURSEMENTS			
	CASH EXPENSE	\$2,923,238	
	ADDITION TO INCOME TAX FUND	109,300	
	DIVIDENDS PAID	50,000	
	INVESTMENT IN PLANT	302,000	\$ 3,384,538
	ADDITION TO CASH ASSETS		\$ 393,582—

FINANCIAL CONDITION

ASSETS		
	NET CASH ASSETS	\$ 758,889
	INVENTORY VALUE	\$ 862,791
	PLANT NET BOOK VALUE	\$12,084,180
OWNERS EQUITY		\$13,705,860

NOTE: Dashes following entries indicate negative numbers. Totals of detail listings appear to the right of the last item.

coordinated with plant capacity and production volume. Investment programs and dividend policies must be geared to available funds. All of these factors must be balanced in the face of continually changing competitive and general business conditions. The need for planning is emphasized by the fact that relatively stable policies are more effective, price for price, dollar for dollar budgeted, *etc.*, than are policies involving much fluctuation.

Total industry market is affected both by business conditions and by the industry-wide constellation of prices and expenditures for advertising and research and development. Each firm's potential share of the total market is determined primarily by the relationship of its policies to those of its competitors. The product's purchasers are fairly sensitive to price differentials, and in the short run to price changes as such. Market shares are also much influenced by advertising and by design improvements resulting from research and development expenditures. Advertising and research and development have effects which extend for several quarters. As might be expected, the impact of advertising is relatively intense but also relatively short-lived, compared with that of research and development.

Production at or below the "capacity" figure listed on the Operating Statements is accomplished at nearly fixed cost per unit, relatively small reductions being a consequence of vigorous research and development programs. Production over and above capacity can be called for, but at an approximately doubled direct cost per unit. Normally, the largest nonbudgeted, indirect costs are those which are fixed and those, such as depreciation, which depend roughly upon plant size. (Exceptions occur if a firm expands its plant too rapidly, or if large cash deficits appear.) Advertising and research and development are costs as budgeted.

Fixed costs make large volume operation advantageous relative to total cost per unit. Costs depending upon plant size levy large

penalties for overexpansion. Underproduction, relative to potential sales, results in loss of revenue through lost sales, rather than in added costs. Overproduction leads to excessive inventories and to correspondingly large carrying charges.

Plant and equipment deteriorate at a rate of 2.5 per cent per quarter, and this deterioration is reflected immediately in reduced capacity. To maintain a given capacity, it is necessary to reinvest accordingly. Reduction in capacity is accomplished by allowing depreciation to take its course, without reinvestment. New capacity is purchased by allocating to "Investment in Plant and Equipment" twenty dollars per unit of quarterly capacity desired, over and above the sum needed to hold ground against depreciation. There are "incidental expenses" associated with purchases of plant and equipment, which are small for moderate rates of expansion, but which become significant when as much as one million dollars is allocated to plant investment in a single quarter, and which grow rapidly with larger investments. Plant and equipment whose purchase is budgeted at the beginning of one quarter is not available for production until the following quarter.

When net cash assets fall below zero, costs are incurred for loan negotiation, interest, factoring, *etc.* These costs become significant with a shortage of a few hundred thousand dollars, and grow rapidly with larger deficits. The administrators of the game may be willing to "buy into a firm" if its cash position becomes desperate, but will not pay more than about half the book value of the equity purchased.

Like all such reports in real life, the Operating Statements used in the game are to some degree "conventional." For instance, inventory value is figured on a standard cost basis, and certain costs are arbitrarily allocated to the "Administration" detail item and others to "Miscellaneous." These conventions and also some quantitative information concerning the factors governing various costs, which are dis-

cussed as part of the preparation of players, will not be taken up here.

Post-mortem discussion. The goals to be sought by participants in the UCLA executive game are not spelled out in detail. Different teams may take different tacks. One may concentrate on expansion and increased sales, for instance, while another may focus more directly on the profit picture. Each team is required to keep track of its broad objectives and of its operating strategies during the course of the game.

The game itself is followed by a discussion of the objectives and strategies of the teams. Each team subjectively evaluates its own work, and is also given an objective "score," based upon over-all profitability, dividend policy, and the condition of its firm at the end of play. The discussion is facilitated by large-size charts summarizing the progress of the game. Some of the charts used are shown by Exhibit 3.

The purpose of the post-mortem is less to reveal better strategies which might have been adopted than to show how better use could have been made of the available information. For example, in the game to which Exhibit 3 refers, the generally successful Firm 4 failed to cut its price in the "recession year" (Year 6), even though the downturn had been forecast and everyone was aware of competitive price cutting. This mistake should have been avoided in view of the available information concerning the consequences to Firm 1 of maintaining a high-price level through the earlier downturn in Year 3. Criticisms of this type help to refocus attention upon the game as an exercise in learning from experience.

Other executive games. A few paragraphs are in order to indicate how some of the other executive games differ from the game just described. Several of these games are discussed in detail elsewhere. The interested reader is referred to the list of papers at the end of this article (which also includes mimeographed

papers giving the full technical details of the UCLA game).

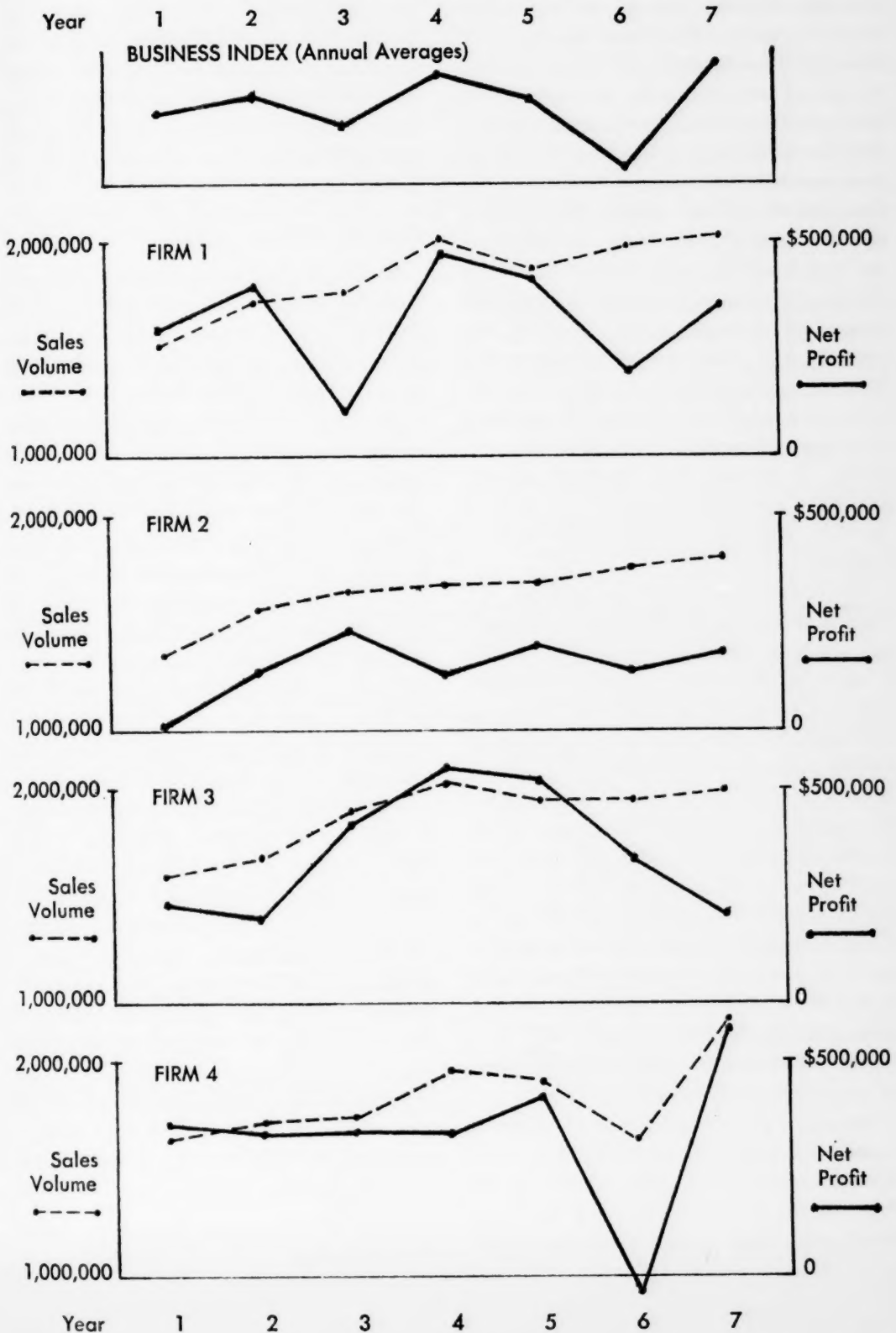
The AMA game, mentioned in an earlier part of this article, much influenced the development of *UCLA Executive Decision Games No. 1* and *No. 2*, and these games are naturally somewhat similar to it. The biggest difference is that the teams in the AMA game are limited to relatively narrow ranges in their decisions, at each stage. The UCLA games allow almost unrestricted choices, but are designed in such a way that failure to follow reasonable and stable policies is penalized. For example, "overspending" is permitted, but results in heavy interest charges. A second point of difference is the AMA game's provision for buying market information beyond that which is made available as a matter of course. The games are completely different in such minor details as report formats.

Another game similar to the AMA and the UCLA games was developed for the International Business Machines Company, by G. T. Hunter and others. In this game, three firms compete in four geographically separate markets. One of these is a "home market" for each firm, and the fourth is normally the principle competitive battleground. A. N. Schrieber, of the University of Washington, has also developed fairly complex executive games for use in business courses. The new game now being test-run at UCLA will also be a complicated one, involving several price-classes of products in the same general line of goods.

An interesting board game has been devised by G. R. Andlinger and J. R. Greene, for McKinsey and Company. This game, which is concerned with a hypothetical capital goods manufacturing industry, is unique among existing executive games in being economically hand-computable. Also, partly to compensate for a relatively uncomplicated underlying model, the progress of play depends relatively strongly upon statistical factors. The wide interest inspired by the McKinsey game has led to a cur-

EXHIBIT 3

CHARTS SUMMARIZING A FOUR-FIRM "RUN" OF UCLA EXECUTIVE DECISION GAME NO. 2.



rent effort to convert *UCLA Executive Decision Game No. 2* into hand-computable form, but it is still not certain that this will be feasible.

Milton Stone of the ElectroData Division, Burroughs Corporation, and others have developed an interesting game especially for the purposes of a recent conference of supermarket executives. This game differs from those previously mentioned in being organized around the decisions and reports typical in supermarket operation, rather than general manufacturing and merchandising. G. J. Feeney, of General Electric Corporation, has designed a relatively generalized executive game, involving two products and three marketing areas, and focusing upon marketing problems broadly representative of one of the GE operating components. A number of executive games referring to various other types of business operations have been proposed, but little information about them has been made publicly available.

An extremely complex game being developed at the Carnegie Institute of Technology, by R. M. Cyert and others, will provide a far more realistic simulation of business activity than do any of the games previously mentioned. In addition to such activities as over-all budgeting, the players will have to make a wide variety of specialized decisions. Because of the complexity of the game, it will be run at a relatively slow pace, perhaps an hour or so of team activity per simulated month. A game with similar characteristics is being constructed at UCLA by Morris Asimow and R. C. Sprowls, and plans are being made to center a special seminar in data processing around this game. It is intended that these games be adaptable for the representation of actual firms and/or industries.

One more game requires special mention, because it is quite different from any of those discussed above. This game, developed at Princeton by J. R. Kennedy and others, is based upon a range of opportunities to go into

manufacturing or selling a hypothetical new product. The players are given capital, which they may invest as they please, within the opportunities presented. This game involves a great deal of personal interaction in the formation of firms and in negotiations among them. It has been test-run as the principal activity of an advanced seminar in industrial psychology.

CLOSING COMMENTS

Reviewing the preceding pages, I suspect myself of too much zeal in emphasizing uncertainties as to the value of business decision games. In a recent talk to the International Press Institute,² Robert Oppenheimer identified a major communication problem common to many scientists: "...when the technical people talk, they always emphasize the fact that they are not sure." Professor Oppenheimer's point is that the scientific concept of certainty is simply too rigorous to be consistently applied and correctly understood in everyday life, where one must act on one assumption or another in any case. Let me conclude with a brief statement, not of what I consider rigorously "proved," but of what I am "sure of" in the same sense that I use this phrase in my own business dealings.

Business decision games are powerful tools of management education and training. The executive games are the best means available, short of practical management work, for providing experience in decision-making teamwork, planning complex operations, and coordinating diverse factors. The specialized business decision games are the most effective teaching devices yet conceived for the subject matter to which they can be applied. Both types of games are extremely useful for arousing the kind of interest and stimulating the kind of thinking which most directly leads to deep understanding of business and business problems.

²Published under the title "The Tree of Knowledge," in *Harper's Magazine*, November, 1958.

Finally, although the games cannot provide the equivalent of experience in business, they do provide one of the most important components thereof: experience in learning from experience.

Business decision-gaming is a practical tool for adding to the manager's practical decision-making ability. I think it can be counted upon to play a major role in the process of improving and professionalizing the work of managing.

REFERENCES

General. The following article is a broad discussion of the purposes and potentialities of executive games:

G. R. Andlinger, "Looking Around: What Can Business Games Do?" *Harvard Business Review*, XXXVI, 4 (July-Aug., 1958), 147-160.

The AMA Game. The first of the following references is a fairly technical description of the game and its purposes, the second is aimed directly toward the businessman, and the third extensively discusses the relation of the game to modern, quantitative techniques in decision-making:

Richard Bellman, *et al.*, "On the Construction of a Multi-Stage, Multi-Person Business Game," *Operations Research*, V, 4 (Aug., 1957), 469-503.

John McDonald and F. M. Ricciardi, "The Business Decision Game," *Fortune*, March, 1958, pp. 140-142, 208, 213-214.

F. M. Ricciardi, *et al.*, *Top Management Decision Simulation: The AMA Approach*. (New York: American Management Association, 1957).

The IBM Game. The following papers, both

published by the International Business Machines Corporation, 590 Madison Avenue, New York City, provide full information for operating and playing the game, which requires an IBM 650 computer and 407 tabulator.

"IBM Management Decision-Making Laboratory, Model 1: Administrators Reference Manual," 44 pp., 1958.

"IBM Management Decision-Making Laboratory, Model 1: Instructions for Participants," 12 pp., 1958.

The McKinsey Game. The following article can also be obtained in reprints which present the *McKinsey Game* in "do-it-yourself-kit" form:

G. R. Andlinger, "Business Games—Play One," *Harvard Business Review*, XXXVI, 2 (March-April, 1958), 115-125.

The UCLA Game. The first version of the instructions for players, and full technical details are included in the following three papers, all published in mimeograph form by the Management Sciences Research Project, University of California, Los Angeles:

J. R. Jackson, "UCLA Executive Game No. 2: A Preliminary Report," 1958, 11 pp.

J. R. Jackson and K. R. Wright, "UCLA Executive Game No. 2: Mathematical Model and Computer Code," 1958, 13 pp.

K. R. Wright, J. R. Jackson and J. L. McKenney, "UCLA Executive Game No. 2: Computing Instructions," 1958, 8 pp.

The University of Washington Game. The following paper is a general description of the game and its uses:

A. N. Schrieber, "Gaming—A New Way to Teach Business Decision Making," *University of Washington Business Review*, April, 1958, pp. 18-29.